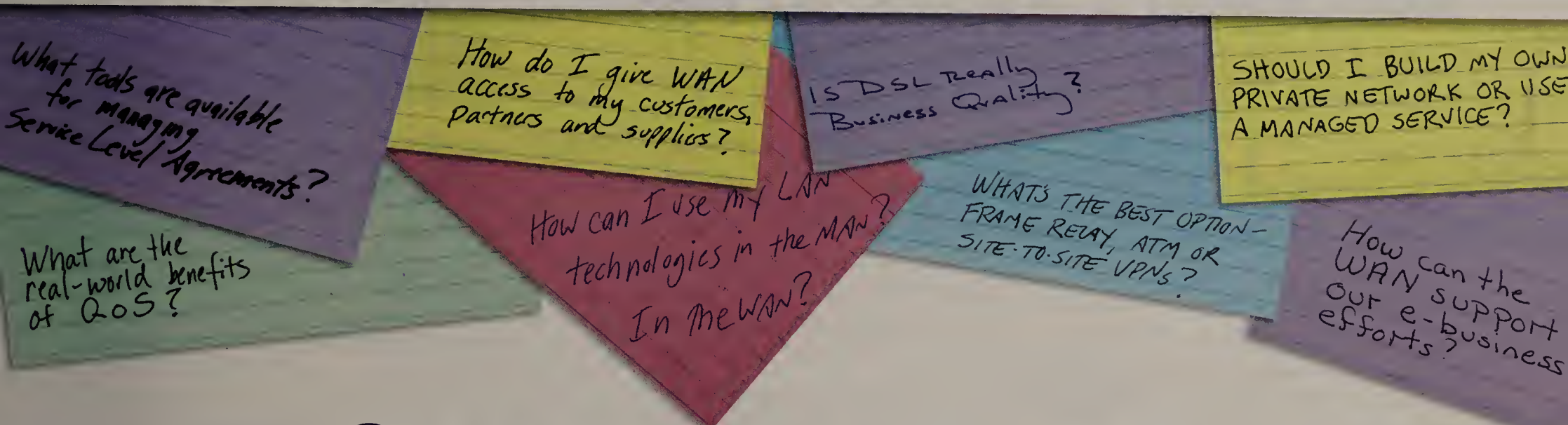


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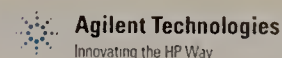
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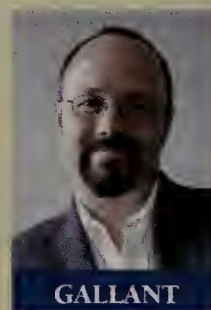
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high-speed data services, and network hardware product management. He conducts tutorials on local area networking, wide area networking, and e-business around the world. And he is on the faculty at Northeastern University's State of the Art Program in Networking.



#### John Gallant

John Gallant is Executive Vice President and Editorial Director of *Network World*, one of the fastest growing publications in the computer/communications industry. With more than 17 years of experience covering this industry, Gallant sets the strategic direction for the newsweekly, which serves 165,000 network IS managers.

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**SPLITTING**  
CABLETRON LOOKS  
GOOD A YEAR AFTER  
IT BROKE INTO  
FOUR "START-UP"  
COMPANIES.  
**PAGE 19**

February 5, 2001 Volume 18, Number 6

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## COMNET 2001: FROM THE SHOW FLOOR

### VoIP hubbub heard over ComNet din

BY PHIL HOCHMUTH

WASHINGTON, D.C. — The voice-over-IP development machine was running full bore last week at ComNet 2001, with a slew of companies cranking out services and products for enterprise and carrier networks.

Big carriers such as AT&T and WorldCom aired plans for voice-over-IP services, while Alcatel, 3Com spinoff CommWorks and Unisphere peddled new wares. Others, including Avaya, Cisco and Siemens, demonstrated interoperability at a lab run in part by *Network World* and open to the 50,000 show attendees.

Security, optical networks and other technologies also were prominent among the 450 vendor displays and 70 See **ComNet**, page 10

### Cisco aims to add oomph to IP nets

BY JIM DUFFY

WASHINGTON, D.C. — Cisco demonstrated a few unannounced products at ComNet 2001 last week, designed to let users implement secure, high-performance VPNs and more tightly meld IP and ATM WANs.

The company said it also expects to ship a 10G bit/sec Ethernet module for its Catalyst 6500 LAN switch in the second quarter, a year before the 10G standard is complete.

The products, expected to be announced this quarter, are intended to raise the integration ante by letting users meld separate networks or separate IP services over one network. For instance, the VPN module runs on routers that are equipped for voice over IP, See **Cisco**, page 12

# A year after meltdown: No silver bullet for DoS

BY ELLEN MESSMER AND DENISE PAPPALARDO

A year after distributed denial-of-service attacks blasted the likes of Yahoo, eBay and eTrade offline, no one has found an easy way to defend against a flood of unwanted IP packets.

In fact, everyone's still pretty



much in the dark — literally, in one case — when it comes to finding a silver bullet.

A recent meeting of the DDoS Working Group, a forum organized last year to plot net-

**"There are political issues and technical issues."**

Tom Clare, DDoS Working Group member

work defenses, was conducted solely by the light of laptops after KPMG International's Silicon Valley office was visited by one of California's rolling blackouts. In the ghostly glow could be discerned John Zent, manager of risk management for Yahoo, and Allen Yousefi, information security officer at eBay, along with representatives from security vendors eager to woo these top e-commerce firms.

The talk was no brighter than the lighting. According to several attendees, Yahoo and eBay are more than just dismayed by the slow pace of finding technical defenses to denial-of-service attacks and the even See **DDoS**, page 75

## MORE FROM COMNET 2001

**p.10** AT&T, WorldCom lay out VoIP service plans.

**p.12** Cisco to ship 10G bit/sec support for core 'Net router — finally.

**p.14** Our Reporter's Notebook looks at the lighter side of ComNet.

Missed ComNet? Don't worry, we have Webcasts of the hottest sessions, including our Security Showdown, available online. Go to [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2837.

## WorldCom eyes a 'smarter' VPN service

BY TIM GREENE AND DENISE PAPPALARDO

WorldCom is looking to expand its VPN services through a partnership with upstart service vendor SmartPipes, offering enterprise customers a potentially powerful alternative to frame relay as a way to connect corporate offices.

See **WorldCom**, page 16

## FEATURE:

Go ahead, cut the cord: Network managers give wireless LANs a stamp of approval. **PAGE 48**



## REVIEW:

Cisco's Aironet 340 wireless LAN access point earns our World Class Award for top performance. **PAGE 50**

## ONLINE:

Interactive Buyer's Guide chart ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2832); saving lives with roving LANs ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2833).

**BUYER'S**  
Wireless LAN access points  
**GUIDE**





*Nice facade. Bad infrastructure.*



# INFRASTRUCTURE: SOONER OR LATER, IT MATTERS.

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INFRASTRUCTURE. The physical foundation of any thriving enterprise. In the world of technology, infrastructure means integrating the servers, software and storage systems of an e-business into one finely tuned machine. And a well-planned, well-executed infrastructure is the underlying foundation of successful communication, commerce, competitiveness and growth within and among e-businesses everywhere.

To put it simply: as goes infrastructure, so goes the enterprise. In today's economy, all the ingenious products, brilliant marketing and champion deal closers won't amount to a heck of a lot if you can't connect to your outside suppliers, if the network crashes or the databases fail (and all you can say to customers is, "Sorry, the computers are down; can you call us back tomorrow?").

Planning, building and maintaining e-business infrastructure is about hard questions: What platforms should I use? How do I plan for the unexpected? Will it grow when we grow? Will it work with new technology in the future? Will it build

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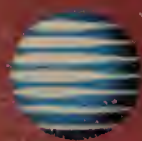
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SPECIAL FOCUS: INT'L DATA NEEDS. *More users turn to managed services for overseas sites.* **Page 28.**

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Cisco plans to release Catalyst 6500 in second quarter.

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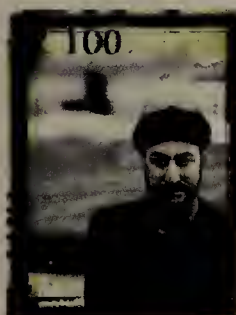
State Street's Gary King prefers flexible pricing.

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Mazu's Phil London targets DoS attacks.

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Preaching technology within your industry.

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## BUYER'S Wireless LAN access points GUIDE



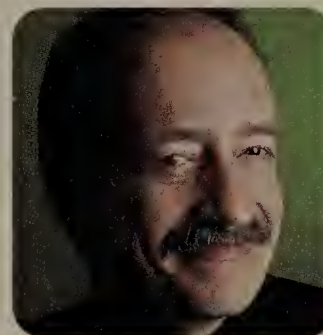
Larry Roll, Mercedes Benz

**FEATURE:** Acceptance of wireless LANs for corporate applications is on the rise, now that high-performance 11M bit/sec gear based on the IEEE 802.11b standard is here. **Page 48.**



**REVIEW:** We tested nine 802.11b wireless LAN access points for the corporate network. **Page 50.**

**FACE-OFF:** Is Windows 2000 ready for full rollout? Nelson Ruest gives the package a green light, while Jeff Allred cites training issues as reason to proceed with caution. **Page 47.**



Nelson Ruest



Jeff Allred

**Editorial:** Don't turn your back on all new, young ventures. **Page 44.**

**Jeff Shapiro:** A little planning can drive away the 'Road Worrier.' **Page 45.**

**James Kobiulus:** FCC adds to instant messaging standards mess. **Page 45.**



**Backspin:** New distribution meets old media. **Page 78.**

**'Net Buzz:** BizRate measures up because BizRate measures. **Page 78.**

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#### Coverage of ComNet 2001

If you were unable to attend ComNet last week, don't worry. Turn up the volume on your computer and settle back for one of our audio Webcasts. Tune in to a presidential-style debate on security moderated by *Network World* Editorial Director John Gallant, or choose from the other three ComNet Webcasts on shared bandwidth, frame relay interworking with IP Security networks and collocation services. **DocFinder: 2837**

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### REVIEWS

#### Test Pilots

*An ace in hand*

We have a winner. Xanatos is our first full-fledged Test Pilots Ace — he submitted eight evaluations of network products and will be rewarded with a leather bomber jacket. Who knows? Maybe you could be next.

**DocFinder: 2839**

#### Net Know-It-All: And the winners are

We've had our first winners — serhat, peggy, kostas and NetMan were our top scorers in last week's quiz. You could be next. Play the Net Know-It-All quiz today. **DocFinder: 2443**

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### COONEY'S CORNER

*The best of the NetFlash daily newsletter*



#### Cautious optimism

That's the overall impression I got from ComNet 2001-goers last week. With an economic slowdown and some industry sore points such as DSL service provider problems and dot-com failures in mind, I asked about 15 exhibitors and a number of regular attendees what they thought 2001 would bring and what they thought of the ComNet 2001 show. A few vendors said the same thing about the show — they thought attendance was down, but the folks coming through their booths were giving them some pretty good sales leads. Most experts are "waiting for the other shoe to drop, either a big buyout or failure of a prominent company," one observer said.

If it's any sort of sign, most exhibitors were conservative with their booths. There wasn't much of the usual glitz and downright silliness of many large trade shows. Not to say there wasn't any — Compuware had a "Survivor"-based booth, Foundry had its muscle-bound Foundryman guy (who sadly, made his last public appearance at ComNet — he's being retired, no word on what will replace him) and Antara.net had a huge smoke-blowing dragon. Overall the show just seemed more conservative than some previous shows (maybe reflecting the current administration, that was not a surprise). If you went, tell me what you thought.

#### ComNet: DSL optimism abounds

New products designed to advance the deployment of DSL services were promoted at ComNet 2001 by a number of companies, which seem to remain confident about the technology despite recent layoffs and financial difficulties at large DSL service providers. **DocFinder: 2853**

— Michael Cooney, associate news editor

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### COLUMNISTS

#### Compendium

*On beer and bigots*

Fusion Executive Editor Adam Gaffin discovers the OS X police and the answer to the question: "What if operating systems were beer?" **DocFinder: 2840**



#### Teleworker Beat

*Back to broadband*

Net.Worker Managing Editor Toni Kistner discusses some good news for Broadband2-Wireless in the wake of DSL disappointments. **DocFinder: 2841**



#### Home Base

*Back-up plan*

Net.Worker columnist Jeff Zbar warns of the need for contingency plans and alternatives when it comes to teleworking and DSL. **DocFinder: 2842**

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## NEWS BRIEFS, FEBRUARY 5, 2001

**Novell launches Volera spinoff**

In a long-anticipated move, Novell last week announced that it's spinning off its Net Content group into a separate firm called Volera. As first reported in *Network World*, the new company will market and develop Novell's Internet Caching System and Content Exchange — its products for speeding the delivery of Internet content. Volera will receive investments from Nortel Networks and Accenture (formerly Andersen Consulting). In exchange for equity positions, Novell, Nortel and Accenture will give Volera more than \$80 million in cash, as well as consulting services. Simon Khalaf, former vice president and general manager of Novell's Net Content division, is Volera's president. Drew Major, former chief scientist and CTO for the Net Content division, has been appointed CTO.

**RSA snaps up competitor Xcert**

RSA Security last week announced its intent to buy privately held Xcert International, a provider of public-key digital certificate management software, for \$67.5 million. RSA CEO Arthur Coviello said the deal would give his firm a roster of 50 new customers, including Aetna, PNC Bank and Wachovia. Because RSA Security and Xcert are competitors in public-key infrastructure software, RSA outlined plans that call for continuing support for Xcert's Sentry Certificate Authority product until the fourth quarter. At that time, RSA plans to have an updated version of its Keon Certificate Server that is expected to integrate many of the features in Xcert's Sentry.

**Messaging organization folds**

After years of battling declining membership, financial problems and management turnover, the Electronic Messaging Association (EMA) is no more. The 18-year-old group, which developed e-mail standards and privacy policies, is now a forum of The Open Group, a consortium that conducts standards-based conformance testing and certification. The Open Group was formed five years ago through a merger of the Open Software Foundation and X/Open Co., which were involved with Unix standardization. The new Open Group EMA Forum will hold its first meeting this month in San Jose. However, EMA's annual conference, scheduled for March in Chicago, has been canceled. More information is available at [www.opengroup.org](http://www.opengroup.org).

**Sun to outline Web initiative**

Sun makes its money selling Unix computers, but this week plans to unveil what it promises will be a new and improved "software strategy" that will promote the development of Web services. Services are server

applications built with components that rely on protocols such as HTTP and XML to interact over the Web. Microsoft has a similar scheme with its .Net project. Sun will have to deliver, or have partners deliver, development tools needed to make the initiative something programmers can use to build such services. Microsoft has a beta-test version of its .Net tool set and a development kit for Simple Object Access Protocol, which lets one component call, or trigger, another over the 'Net.

**Roscitt leaves AT&T Business Services**

Rick Roscitt, a 28-year AT&T veteran, resigned last week as president of AT&T Business Services. Roscitt is moving to ADC as that firm's CEO and chairman effective Feb. 15. Roscitt was named president and CEO of AT&T Solutions — the firm's outsourcing arm — in December 1999 and is credited with much of that division's success. When AT&T announced a restructuring plan in October that split the company into four units, Roscitt was named president of the carrier's business services group. AT&T has not named his replacement.



AT&T veteran Rick Roscitt will be come ADC's CEO and chairman.

**Vulnerability discovered in DNS code**

Network Associates last week uncovered a vulnerability in the BIND 4 and BIND 8 Domain Name System (DNS) code used in many Unix operating system products, including those from Sun, Hewlett-Packard and IBM, and Linux and BSD. The discovered flaw in the DNS software lets attackers take control of DNS servers via a buffer-overflow attack. Although there are no known instances when this has occurred, a patch has been created.

**Juno looks to harness power of users**

Free ISP Juno Online Services hopes to use the processing power of its customers to form a virtual supercomputer for biomedical research, the firm announced last week. Studies suggest the computers of Juno's active free subscriber base would together represent the world's fastest supercomputer, measured in terms of aggregate instructions per second, if all were simultaneously working on one computational problem. The firm has 14.2 million registered users, of which about four million use Juno's free connection to the Internet. Juno aims to sell computer cycles to bioinformatics firms that conduct drug and medical research. The companies would use the cycles to work on computational problems that require lots of processing power.

# Open source databases preparing for prime time

BY DENI CONNOR

NEW YORK — Open source databases may not yet be armor-clad enough for use as back-end corporate data stores, but observers say those displayed at the LinuxWorld Conference & Expo last week are on the right track. At the very least, analysts say, these databases are becoming viable foundations for Web and application servers.

Start-ups NuSphere and Great Bridge were among the firms showing off open source databases, free software they are bolstering with support for:

- Referential integrity, which prevents users from entering erroneous or inconsistent data into fields.
- Online backup, which allows for the preservation of database copies without taking the primary database down.
- Triggers, which can kick off a new operation after another is performed.

NuSphere and Great Bridge offer their respective products, MySQL and PostgreSQL, for free. However, they charge for optional service and support. MySQL and PostgreSQL, like the Linux kernel, are developed as open source projects and have been adopted for commercialization. Open source databases run on Linux and various flavors of Unix and BSD.

In addition to those features, Great Bridge's PostgreSQL will soon gain other enterprise application-level capabilities, such as write-ahead logging. This feature could be used to protect the integrity of a transaction in the event of failure — intended database changes are sent to a log before being written to disk.

NuSphere, meanwhile, is building essential database functionality into MySQL, such as record and transaction locking "that will make it increasingly more viable as a database in midsized networks," says George Weiss, an analyst at Gartner Group.

Weiss doubts NuSphere's MySQL or Great Bridge's PostgreSQL will replace corporate Oracle databases any time

soon. But he suggests they have applicability in multitier application environments.

"In a multitiered system where you have a back-end corporate database and front-end systems that are compiling certain local databases, it's possible that the open source databases will be used in front-end applications of a simpler nature," he says.

However, some users say they are willing to consider open source databases instead of products from Microsoft, Oracle, Sybase and other leading database vendors.

"I see MySQL as mainly in competition with Microsoft's SQL Server for the middle ground and with Oracle's databases more at an enterprise-level system," says MySQL user J. E. Martin, technology coordinator at the University of Arkansas in Fayetteville.

"I wanted a database I could use as an [application server] back end for Web sites, so that I could add more dynamic content," Martin says. "Our project is a nonprofit, so I can't really hand over \$1,500 for a database system when I can have one for free."

Don't think Oracle isn't taking notice of the open source database companies. The firm last week introduced the Oracle Migration Workbench Release for Red Hat Linux 6.2, designed to help MySQL users migrate to Oracle databases. The package can be downloaded from [otn.oracle.com](http://otn.oracle.com).

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## LINUX IN THE SPOTLIGHT

Hewlett-Packard, IBM and Oracle were all touting the benefits of Linux at last week's LinuxWorld. Find out what they and others are doing on the Linux front.

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# AT&T and WorldCom dive into voice over IP

BY DENISE PAPPALARDO

WASHINGTON, D.C. — AT&T and WorldCom last week separately introduced services designed to help customers cut costs and simplify their networks by running voice traffic over new or existing IP and frame relay links. However, the actual cost savings customers can expect from the highly anticipated services are hard to determine because both carriers were coy about pricing.

AT&T launched voice-over-IP support for its Managed Internet Service (MIS) — an IP offering — and Managed Router Service (MRS) — a frame relay offering. Customers can convert their PBX voice traffic into packets using Cisco 2600 or 3600 routers for transport over the carrier's IP or

frame relay network.

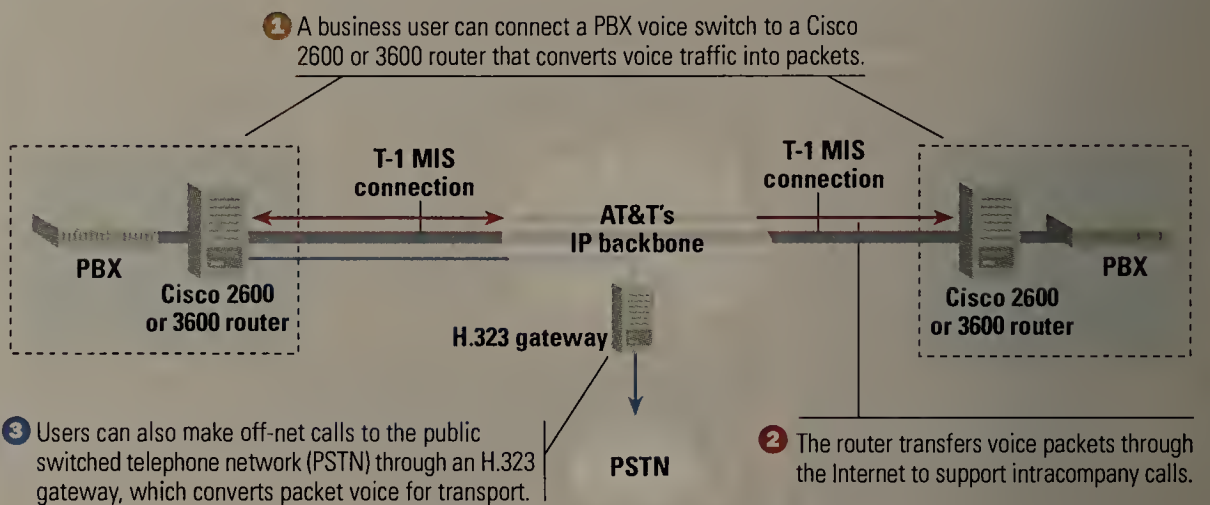
MIS customers can also make off-net calls over the public switched telephone network (PSTN). But frame relay customers are restricted to on-net, intracompany calls until the end of June, when the carrier will launch support for PSTN calls.

The services, available now, are expected to reduce traditional voice costs because the per-minute and termination fees of domestic and long-distance calls can be eliminated by routing the traffic onto the carrier's IP or data network.

"The No. 1 reason we're using [voice over IP] is for cost savings," says Mark Huang, a WAN project manager at Tower Automotive in Grand Rapids, Mich. The auto supplier is testing AT&T's MRS with voice over IP at a handful of sites, and looks

## VoIP for AT&T Managed Internet Service users

AT&T's voice-over-IP service is available to managed frame relay service and MIS users.



forward to converging voice and data onto a single network for simpler management.

While the services intro-

duced last week represent the first phase of AT&T's voice-over-IP strategy, users can expect enhanced features that combine

voice and data directly to the desktop, says Kathleen Earley, the carrier's president of Inter-  
See **VoIP**, page 76

ComNet,  
continued from page 1

sessions, but voice over IP was the biggest attention-getter, for better or worse.

"It's prime time for experimentation of voice over IP by companies, but it's not prime time for mass deployment," said Frank Dzubeck, president of consulting firm Communications Network Architects, adding that large implementations won't take hold until 2004.

"A lot of confidence-building needs to be done and feature richness needs to be developed," Dzubeck said. Common telephony features, such as 911 access or simple conference call setup, are not present in many voice-over-IP service offerings and call servers.

Still, much of the conference had users talking about how to talk over their data networks.

"We're due for a major phone system upgrade," said David Wylie, LAN administrator for the Bank of New York in Harrison, N.Y. "I'd like to see voice over IP in there."

According to research firm Phillips InfoTech, the number of IP PBX line shipments worldwide will explode from 71,700 in 1999 to 5.7 million lines by 2004. Traditional circuit-switched PBX line shipments

are expected to drop by 37% during the same time period, but will still out-ship IP in 2004 by more than a half million lines.

Voice-over-IP products on display at ComNet focused on areas such as connecting remote offices with IP-based call servers and quality-of-service (QoS) management for enterprise voice-over-IP net-

4400 call server platform, including support for small, PBX-less branch offices using IP phones and a Media Gateway for connecting larger offices (up to 500 users) to a central OmniPCX via a WAN connection. In addition, Alcatel showed off enhanced Lightweight Directory Access Protocol-based software for managing an IP phone network.



Over 600 conference-goers at ComNet stopped by the Voice over IP Interoperability Lab, put on by Miercom and Network World.

works. Carrier gear for delivering integrated voice and data services to businesses also made its presence felt.

Alcatel announced several new features for its OmniPCX

Shomiti Systems introduced its Shomiti QoS for VoIP Communications product for measuring the quality and performance of voice-over-IP calls on a LAN. The product consists of a

monitoring device, which sits on a network and analyzes traffic flows, and console software for viewing voice-over-IP network metrics.

Unisphere announced a voice-over-IP module for its SMX-2100 service mediation switch for carriers that translates between IP and circuit switched networks. The firm said its server-based telephone softswitch will be available by spring, as will its ERX-1400 edge router, which features Multi-protocol Label Switching to support QoS for delivering voice and data services to business subscribers.

Separately, CommWorks made its corporate debut and demonstrated voice-over-IP service delivery with its Total Control 2000 access platform and CommWorks 4000 softswitch for carriers.

Also, Vina Technologies announced its Multiservice Xchange-400 (MX-400), an integrated access device carriers can use to deliver voice-over-IP services. The MX-400 sits at a customer's premises and uses the Media Gateway Control Protocol for delivering bundled public switched telephone network and Internet access to business customers via frame, ATM or IP over leased T-1 and xDSL connections.

Voice-over-IP gear was put to the test at ComNet by Miercom,

a network hardware testing firm, which organized the Voice over IP Interoperability Lab with *Network World*. The lab featured equipment from nine vendors, including voice-over-IP gateways, call servers and IP phones based on H.323 and Session Initiation Protocol, as well as voice QoS management platforms.

The Bank of New York's Wylie, who visited the lab, says his company uses a 10-year-old Nortel PBX in the company's headquarters and older key systems from Nortel and Avaya (formerly Lucent) in the bank's 10 branch offices around the state. Wylie has looked at IP PBXs from Alcatel and Avaya, and likes what he's seen. He is also considering Cisco's call server products, since his network is already based largely on Cisco Catalyst switches.

"What we're thinking is, why pay to install and maintain two different kinds of technologies [for voice and data] when you could do them both with just one?" Wylie said. Plus, he added, "Wouldn't it be great if you could do the administration of the phone system over the LAN, adding and setting up users just like you do on the network?"

Senior Editor Tim Greene contributed to this story.





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# Cisco reannounces 10G Internet core router

BY JIM DUFFY

WASHINGTON, D.C. — A year behind its closest competitor, Cisco now plans to ship 10G bit/sec capabilities for its Internet core routers in March.

At ComNet 2001 last week, Cisco said an OC-192c line card, a four-port OC-48c module and a 320G bit/sec switch fabric for its 16-slot 12016 Gigabit Switch Router (GSR) will be available next month. These products were initially announced in December 1999 along with the 12016.

Cisco's 10G bit/sec capabilities mean enterprise users should expect new high-speed services on more service providers. For example, Sprint will have a 10G bit/sec backbone built on the new Cisco

products later this year, says Chris Clark, vice president of Global SprintLink product management for Sprint E|Solutions.

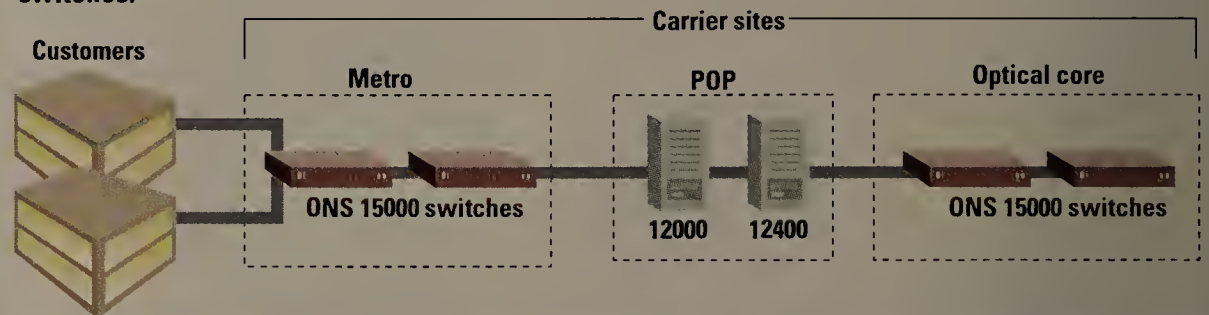
Cisco has a 69% share of the Internet core router market, according to Dell'Oro Group, but was lagging behind rival Juniper Networks in 10G bit/sec capability. Juniper has been shipping OC-192c since last March.

Qwest Communications, which announced its 10G bit/sec network last week, tested Cisco's gear but opted for Juniper because it was available, a Qwest spokeswoman says. Juniper has steadily gained share from Cisco and now owns 30% of the Internet core router market, according to Dell'Oro's third-quarter 2000 data.

The new 320G bit/sec switch

## Putting the router in its place

Cisco's new 12400 router provides IP services for optical networks built with Cisco ONS 15000 series switches.



fabric transforms the 160G bit/sec 12016 into what Cisco now calls the 12416. The switch fabric lets the 12016 — or 12416 — run new 10G bit/sec single-port OC-192c and four-port OC-48c packet-over-SONET line cards.

At the time of the 12016 launch 14 months ago, Cisco said the OC-192c blades would see wide deployment in the second half of 2000. That means they're up to nine months late.

What really is new from last week's announcement is a 10-

slot, 200G bit/sec version of the GSR, called the 12410. This is a lower-density, 10G bit/sec-capable router that takes up half of a telephone company's rack as opposed to the 12416/12016, which takes up a full rack.

Cisco also plays up the investment protection inherent in a 12000 to 12400 upgrade. Companies with an installed base of 12016 chassis need only replace switch fabrics to gain 320G bit/sec capacity. Chassis, line cards and software remains the same, and OC-192c ports can be added as needed.

"Cisco has allowed us to upgrade the basic router to the denser line cards," Sprint's Clark says. "That suits our needs."

Conspicuously absent from Cisco's 12400 rollout was any mention of terabit scalability. Cisco had a compelling 5 terabit/sec story to tell when it announced the 12016 in late 1999, but such was not the case with last week's 12400 launch, leading to speculation that Cisco's terabit story is not resonating with service providers.

Sprint, which says it helped Cisco develop the 12000 GSR, was evasive when asked if it is involved in the "Teracore" development and what the status of that development is.

"I'd prefer to have Cisco answer that question," Clark says.

Cisco's terabit strategy is still evolving, says Robert Redford, a Cisco marketing official.

"We're looking at ways to do it better," Redford says. "The need for terabits is still a little bit farther out there. Customers wanted 10G bit/sec first."

The 12400 routers and 10G bit/sec line cards will ship in March. The 12410 starts at \$120,000 and the 12416 starts at \$130,000. ■

Cisco,  
continued from page 1

which basically means users can integrate their voice over IP and VPNs over the same network.

Cisco's booth showcased a VPN hardware module for the company's 2600 and 3600 series routers. The module increases the performance of software-based VPN encryption for the 2600 and 3600 by a factor of 10, Cisco sources say.

The VPN module occupies a single slot in the Cisco 2600 or 3600 chassis. The module performs encryption and IP Security-related tasks in hardware, freeing the router's main processor to perform other router, voice-over-IP and firewall functions.

The module encrypts data using the Data Encryption Standard (DES) and Triple-DES algorithms. When equipped with the VPN module, the 2600 and 3600 routers will support as many as 2,000 encrypted tunnels at speeds up to 24M bit/sec, Cisco sources say.

The sources say it is shipping now and costs about \$1,500.

For melding IP and ATM WANs, Cisco showed the Universal Router Module (URM) for its IGX 8400 WAN switch. The URM is designed to provide native support for Cisco IOS-based IP services, including voice over IP, on the IGX 8400.

The product is targeted at ATM WAN enterprise users looking to support voice and data integration on a WAN connecting branch sites to corporate headquarters. It brings support of the H.323 packetized multi-



10G bit/sec Ethernet is coming in Q2 for the Catalyst 6500.

media standard to the IGX, which means it should swap packetized voice and video with non-Cisco gear.

URM lets users peer the IGX with other Cisco IOS-based switches and routers for tighter integration of ATM and IP WAN infrastructures. This alleviates the need to run parallel IP and ATM networks, Cisco says.

The URM features two voice-enabled T-1 or E-1 ports for connecting to PBXs or the public switched telephone network, and two Fast Ethernet ports for

LAN connections. The URM interoperates with Lucent Definity, Nortel Networks' Meridian and SL-1, ROLM/Siemens HICOM, NEC NEAX 2400, Toshiba Strada DK424, Mitel 2000SX and Ericsson PBXs, Cisco says.

It supports up to 60 voice channels, and up to 30 modules can be stuffed into an IGX switch for a total of 1,800 voice channels.

The URM sports a Reduced Instruction Set Computing processor with up to 85K packet/sec of switching performance. It also has a 155M bit/sec connection to the IGX backplane and a slot for additional processing or hardware acceleration cards.

Pricing and availability of the URM was unavailable at press time.

The Cisco booth also housed a 10G bit/sec Ethernet module for the Catalyst 6509 switch. A Cisco product manager at ComNet said the company expects to ship the module in the second quarter.

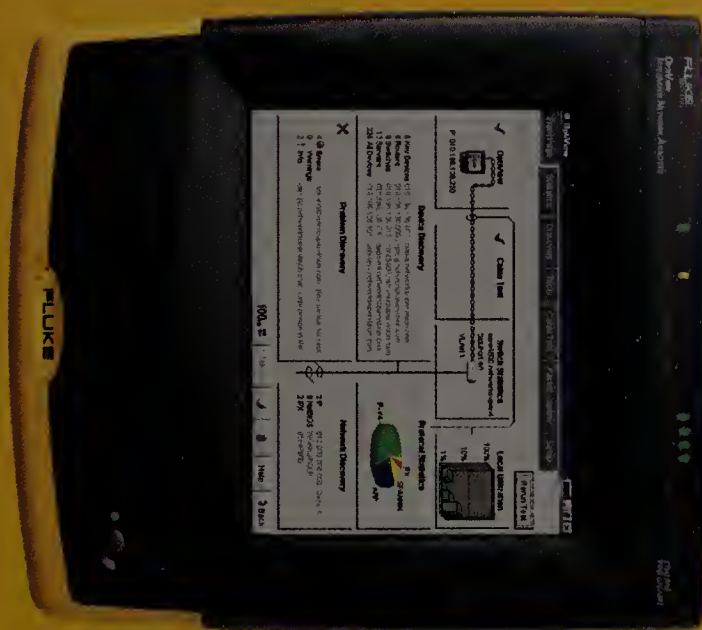
That would be about a year ahead of the 10G bit/sec Ethernet standard, which is expected to be finalized next spring.

"That's pretty much in line with what we were forecasting" for vendor shipments, says Seamus Crehan, an analyst at Dell'Oro Group. "There's a lot of interest and anticipation for this market and this technology" for next-generation applications.





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# Vendors grapple with security threats, each other

BY TIM GREENE

WASHINGTON, D.C. — Companies need to pick and choose from a variety of security vendors to ensure they get the best products to protect their networks.

That's what a panel of security vendors told a ComNet 2001 crowd last week at the Network World Security Showdown. While some companies represented on the panel offer a range of equipment, they acknowledge their rivals may actually do a better job with individual technologies.

"Nobody has a solution to all the problems that are going to arise," said Bob Blakely, IBM-Tivoli's chief scientist for security, even though his company claims to meet all security needs. "Don't believe our marketing or anybody else's if they are obviously untrue."

Greg Smith, director of product marketing for firewall experts Check Point Software, admits his company doesn't



Representatives of the top five security vendors went toe-to-toe last week at the Network World Security Showdown. The participants, from left to right: Bob Blakely of IBM-Tivoli; Rob Clyde of Symantec; Marvin Dickerson of Network Associates; Simon Perry of Computer Associates; and Greg Smith of Check Point.

even attempt to offer elements of network security such as antivirus protection or intrusion detection — but he couches that as a strength. By teaming with top vendors in other areas, Check Point makes it possible to build a security scheme using only the best components, he claims.

During a spirited debate, the top five security vendors as ranked by IDC sparred over which offers the best network protection, but agreed on some principles.

For instance, no single type of security — firewall, intru-

sion detection, antivirus software — could protect against all threats. "There is too much code and too many lines of code to block all holes," said Rob Clyde, chief technologist for Symantec enterprise solutions. They agree that firms cannot look at security as a one-time event; they must constantly review and improve defenses.

Company executives need to be more wary than ever as they open their networks to legitimate business partners because at the same time attackers are becoming more

sophisticated, the panel agreed.

"You are letting strangers in to operate your machines," Blakely said. Some of those strangers are there on legitimate business, but others are there to cause mischief or worse.

Panelists tried to poke holes in each other's products. For instance, Blakely pointed out that Computer Associates' eTrust products must be present in all networks crossed in, say, an e-business transaction in order to be effective. Simon

Perry, CA's vice president of security, acknowledged that was true, but countered that would not be a problem if companies did as they should and carried out security analyses of business partners' networks. Based on the results, they can then defend their networks. He recommended compartmentalizing corporations to isolate the resources business partners have access to.

Some promising new technologies being touted by these companies still need development, the vendors admitted. For instance, Marvin Dickerson, Network Associates' director of product management, said his company's CyberCop Sting software, which redirects hackers to a decoy machine that appears to be the enterprise network, is still intended for a small, select group of firms. Only major financial institutions and "three-letter organizations in government"

See **Showdown**, page 76



## Reporter's Notebook THE LIGHTER SIDE OF COMNET 2001

Here is a sampling of sights seen and words heard around the show last week:

### Puppets and dragons and dinosaurs, oh my

Hands down the most popular booth giveaway items at the show were plastic "walk-a-pet" toys. Antara.net's dragon and Emerge-corp's dinosaur were the big giveaways. Antara.net went a bit further with a 10-foot-high smoke-breathing dragon in its booth. The Flamethrower dragon needed three people to operate its 60-pound head and 14-foot wings.

### Booorrrring...

Antara.net's booth aside, ComNet booths in general were, let's say, lacking any quality-grade entertainment — at least for a trade show. One observer said vendors weren't willing to "pony up the cash for too much glitz this early in a year where there could be a slow economy." Maybe they're saving for Interop, he said.

### Hangover heaven

Who knew ComNet attendees liked to



party so hard? Beating out all comers as the ultimate booth tchotchke was pain relief. Hubbell, a maker of premise wiring and connectors, gave away about 100 packets of Bayer, Anacin, Motrin and Tylenol. By 12:30 p.m. Wednesday, they were "sold out" — with Tylenol going first.

### Nevermind...

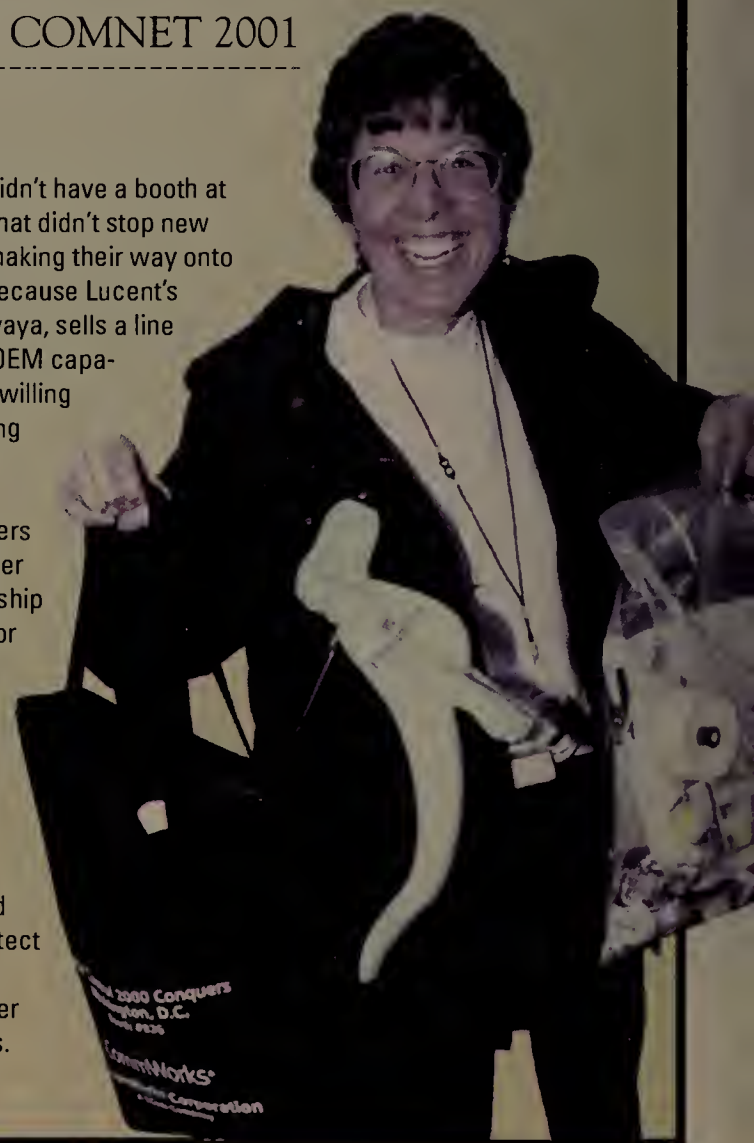
Telco Systems says it did a big trademark search before choosing the name CopperMax for its new very-high bit rate DSL gear. But the name was already taken by a maker of sunglasses and a firm called Hekimian, which makes a DSL line-test box. The Telco Systems gear on display at ComNet had already been painted, so the company taped on the new name: EdgeLink.



### No-show?


Ailing giant Lucent didn't have a booth at ComNet this year. But that didn't stop new Lucent products from making their way onto the show floor. That's because Lucent's "enterprise" spinoff, Avaya, sells a line of VPN products in an OEM capacity that Lucent was unwilling to unload to Avaya, along with Lucent's PBX and LAN switching gear.

At Avaya's booth, users could spot a new, smaller version of Lucent's flagship VPN Firewall Brick 80 for branch offices. Code-named the Brick 20 and expected out this spring, it's designed for small and home office use and is expected to compete with WatchGuard's Firebox line and other products that protect against intrusion into always-on DSL and other broadband connections.





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# Sprint boosts ATM offerings to support ION service

*Provider serves up voice over ATM that company says will whet appetites for ION.*

BY MICHAEL MARTIN

KANSAS CITY, MO. — Sprint ATM customers got a double enticement last week — a voice-over-ATM service that lets them push data as well as voice traffic over one line and a service-level agreement guaranteeing a restored network connection within four hours of an outage.

Sprint is billing its voice-over-ATM offering as a step on the path to its heavily touted, yet largely invisible, Integrated On-demand Network (ION) service.

"This would let a customer get a taste of what ION will provide," says Melody Allen, a

group manager with Sprint.

Sprint has been boasting about ION, which provides voice, video, data and IP services over an ATM backbone, since 1998. But the company has not announced many ION customers since then.

The voice-over-ATM service connects Sprint ATM customers to Sprint's DMS 250 long-distance voice network through Nortel Passport public switched telephone network gateways.



**Sprint's Greg Gordon says the voice-over-ATM service won't have as many features and management options as ION.**

Sprint had been offering customers another voice-over-ATM service, but it relied on customer premises equipment and could only be used for interoffice voice traffic.

Allen says the new service is geared toward large corporate and institutional users, but could also fit into the

plans of some smaller organizations. Customers using the service would still pay their nor-

mal voice fees and ATM network access fees, but would save money by eliminating their separate voice-access charges. Customers would also have to pay a small gateway fee, Allen says.

Sprint already has approximately 50 large customers using either the voice-over-ATM service or a similar ION service. The main difference between the two offerings is that ION includes more features and management options, says Greg Gordon, Sprint's director of emerging services.

Rob Carlson, an analyst with consultancy Current Analysis in Sterling, Va., says the voice-over-ATM offering should appeal to

companies already running on Sprint's ATM network.

Sprint's new SLA for its frame relay and ATM customers expands on the provider's existing 100% availability SLA.

"We saw some customer concern over if there was an outage how quickly Sprint would get to it," says Joe Kimball, group manager of data services.

Internally, Sprint had a benchmark of four hours to repair outages. Now it has made that benchmark a guarantee. If Sprint does not repair an outage in four hours or less, customers will receive credits on their bills. ■

**WorldCom,**  
continued from page 1

With such a partnership, WorldCom could offer its customers the ability to add and drop business partners and make other VPN changes quickly through a central policy engine based in SmartPipes' network. This offering would be an add-on to the fully meshed, flat-fee, site-to-site VPN services WorldCom already offers called IP VPN Total Access.

The advantage over frame relay and other VPN services is that end users could make VPN changes immediately through a secure Web site, without calling on WorldCom to do anything. With a frame relay network, such changes would take weeks or even months to implement.

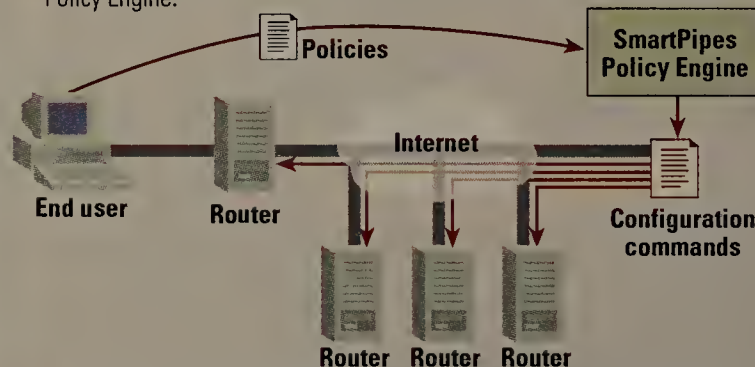
Both companies say that for now they are testing the SmartPipes service with WorldCom's, and that they are seeking beta customers. Neither would say when WorldCom will decide whether to add SmartPipes to its service.

SmartPipes' technology lifts the burden of having to configure VPN policy changes device-by-device via command line interfaces, reducing errors and saving valuable staff time. Such individual configuration can amount to a half hour per device, says Den-

## SmartPipes powers VPN services

**SmartPipes Policy Engine can speed configuration of enterprise VPN devices.**

1 Customers set VPN policies over the Internet by connecting to SmartPipes Policy Engine.



2 The Policy Engine translates the policies into configuration commands that it downloads to individual VPN devices at customer sites, saving time and reducing errors.

nis Brouwer, a SmartPipes vice president. Because the Policy Engine interface is graphical, it also requires less-skilled technicians than the alternative, he says.

Customers access the engine via a secure Web site and set policies using a browser. Policy changes are translated to configuration commands for each VPN device in the customer network, then downloaded via the VPN.

So far, the Policy Engine supports only Cisco routers and Microsoft Windows 2000 servers. SmartPipes says about 80% of firms have sites equipped with one or the other.

WorldCom's current IP VPN Total Access service calls for Lucent Access Point routers at each corporate site, so a WorldCom service would require Cisco or Microsoft gear, or SmartPipes would have to extend support to Lucent boxes. SmartPipes plans eventually to expand its support to gear made by Lucent and Nortel, but has no target date, Brouwer says. The company also plans to produce a developer's kit for equipment makers so they can customize their VPN equipment to be configured by SmartPipes Policy Engine, he says.

SmartPipes' business model

calls for selling its service through ISP partners, as well as directly to firms.

Customers that own Cisco routers and Win 2000 servers and an Internet connection to each site can set up their service by logging their VPN devices into SmartPipes' directories. Alternatively, an ISP selling a SmartPipes service could set up the service for them. The ISP could also ship preconfigured Cisco and Microsoft boxes to customers that don't have that gear.

In addition to making automated policy changes, the service would monitor and maintain the state of routers and send alarms to the ISPs' support centers. SmartPipes also supplies a record of any policy changes.

"They have a very sophisticated Active Directory architecture," says Raymond Ken-eipp, an analyst with The Burton Group. The directories maintain records of the configurations of thousands of customer devices and any changes customers make to them, he says.

SmartPipes plans to sell its policy automation services through other service providers, although so far WorldCom is the only company to publicly acknowledge interest. According to SmartPipes' model, these partner-providers would then sell the pol-

icy automation service to corporations under their brand name, bundled with an Internet access service. Such a service would also bear a "Powered by SmartPipes" logo, Brouwer says.

SmartPipes says it has not determined yet how to charge for its service, but says it will likely be linked to the size of the Internet connection each customer site has — the larger the pipe, the more the customer pays. ■

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# Ariba's purchase of Agile poses challenge

BY KATHLEEN OHLSON

**MOUNTAIN VIEW, CALIF.** — Communication between manufacturers and suppliers exchanging product design information is generally hit-or-miss at best. The process of shoring up those links, increasingly known as collaborative commerce, will be a hot topic in the business-to-business marketplace this year.

"[Collaborative commerce] is very topical. It's not a fad," says Tim Clark, an analyst at Jupiter Research. It lets suppliers know where their inventories are located in their supply chains, while enabling buyers to receive large orders on short notice.

Ariba last week took a leap into the collaborative commerce arena, announcing its intention to acquire Agile Software, a San Jose supplier of Internet-based content management software, in a stock deal worth approximately \$2.55 billion. Agile's software lets companies swap manufacturing and supply information over the 'Net.

Industry experts say Ariba's acquisition of Agile was a smart move because their products complement each other.

"Agile has good products,

and if Ariba didn't grab them, somebody else would," says Jack Clark, an analyst at Zona Research.

However, the acquisition is

## Ariba CEO assesses market

Go online to access our recent interview with Ariba CEO Keith Krach.

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also ruffling feathers within an alliance announced less than a year ago by Ariba, i2 Technologies and IBM. The trio was supposed to market combinations of their software to business-to-business marketplaces, and with Agile being a direct competitor of i2, that company's executives are making noise about the conflict.

Ariba will integrate its Buyer software with Agile Anywhere to help companies use the Internet to buy direct goods. Direct materials are specific components that go into prod-

ucts, such as a battery for a cell phone. Indirect materials are commodity items, such as office supplies. Ariba Sourcing software will be integrated with Agile Buyer, letting customers design a product, buy components and then mass-produce the final product.

Larry Mueller, Ariba's president, says further integration details will be announced this month with a goal of a summer rollout.

Jupiter's Clark says customers generally want to deal with only one vendor, and if Ariba succeeds with the Agile integration, customers won't have to rely on system integrators to stitch their business systems together.

However, Ariba and Agile will have to face several hurdles, according to analysts.

"The process won't be a cakewalk," says John Derome, an analyst at The Yankee Group. There's a lot of coding involved, and each process — indirect and direct procurement — is meticulously defined, he says.

## Novell aims to ease service pack installs

BY JAMES NICCOLAI

Novell last week said it is rolling out new technology to make it easier and faster for customers to install service packs on their servers.

The ZENworks for Servers 2 feature will let administrators automate the rollout of support packs across NetWare servers. Previously, ZENworks could be used to distribute service packs, but the installation process had to be done manually.

The installation feature supports NetWare 4.11 and higher, and will be available for

download free for ZENworks for Servers 2 customers from [www.novell.com/download](http://www.novell.com/download). Novell is making the public beta-test version available at <http://support.novell.com/beta/public/>.

*Niccolai is bureau chief for IDG News Service in San Francisco.*

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Ariba will still have to fill other holes in its collaborative commerce model.

"Content issues top the list of hurdles marketplaces need to overcome," says Sue Aldrich, an analyst at Patricia Seybold Group. Business content must be consistent throughout the supplier line. ■

## Report says 2001 to be turning point for ASPs

BY JENNIFER MEARS

This year will be a turning point for application service providers as they rethink their business models and battle to be among the survivors in the fast-growing market, research firm IDC says in a new report.

"We're at the point where ASPs really need to differentiate themselves by offering additional types of services," analyst Amy Mizoras says. She expects ASPs to try differentiating themselves by devoting more resources to customer service and to turn on new services in areas such as security and storage.

In its report, IDC says companies this year also can expect a slew of ASPs that will design software specifically for the Web, rather than retooling packaged software for hosted delivery.

Overall, IDC agrees with other analysts who expect a big shakeout in 2001 as the hype around the ASP model dissipates, and companies get down to business.

"Without a doubt, ASPs are in for an interesting ride in 2001. For some, the worst is just around the corner, as they fail to successfully execute the model. However, it will be a billion-dollar market in 2001, and for ASPs that understand the market and play wisely, the best is yet to come," IDC analyst Jessica Goepfert says. ■

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# Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

## Briefs

Dell and Unisys recently announced an agreement to sell notebooks, desktops and servers from one another's lines over the next three years that could result in \$1 billion in sales, the firms say. The deal will extend some new services to Dell end users through Unisys offerings. The agreement calls for Dell to buy 16-processor and 32-processor symmetric multiprocessing systems from Unisys and sell them under the Dell name. Dell will serve as the direct service and support contact for users who buy those systems, but will partner with Unisys to give users installation, maintenance and technical support. For its part, Unisys will buy dual-, quad- and eight-processor PowerEdge servers from Dell and resell them under the Unisys name. Unisys will provide its own support and service for those systems. Unisys is also going to provide managed network services and standard rollout services for Dell end users installing OptiPlex desktops, Latitude notebooks and single-processor PowerEdge Servers.

Dell: [www.dell.com](http://www.dell.com); Unisys: [www.unisys.com](http://www.unisys.com)

Users won't need to worry about downtime with a new clustered appliance package Compaq launched this month. The TaskSmart N-Series network-attached storage appliances can now be clustered in two-node configurations and supply failover protection. Both systems are actively running the same processes. When one fails, the other continues operations. When the failed box is repaired, it is added back into the cluster configuration without affecting performance.

The TaskSmart N-Series Cluster supports more than 10 terabytes of storage capacity and starts at \$175,000. It will be available this quarter.

Compaq: [www.compaq.com](http://www.compaq.com)

## Cabletron split-up: One year later

The four spinoffs and Cabletron have all seen revenue grow over the past four quarters.

BY PHIL HOCHMUTH

One year after Cabletron reinvented itself as four "start-up" companies, users and analysts are giving the move good grades.

Last February, the network vendor announced a major restructuring plan, which involved splitting the firm, with Cabletron acting as a holding company. Another part of the restructuring included the sell-off of non-profitable business units, such as network technology it had acquired from Digital and its low-end NetVantage switch and hub business.

From the breakup came Riverstone Networks, which sells metropolitan-area network service provider equipment; Enterasys, which makes enterprise LAN gear; Global Network Technology Services (GNTS), which sells professional IT services; and Aprisma Management Technologies, which develops and sells the Spectrum network management platform.

"Looking back after a year, the transformation was absolutely the right thing to do," says Piyush Patel, CEO of Cabletron. As a result of the restructuring, he says, "we've built up good momentum in all four start-up companies. . . . We've made our existing employees more passionate about what they do by bringing a sense of ownership into [the] existing employee base. It has also given us a good platform for recruiting outside talent."

The bottom line has proven the point, Patel says. Each company has experienced individual revenue growth ranging from 5% and 30% over the past four quarters. Cabletron as a whole (counting all four companies and its own operations) has grown by 10% in revenue during the past year. This kind of growth would not have been possible under Cabletron's old business model, he says.

The year 2000 was also tumultuous for many large enterprise network companies, including Cabletron, 3Com and Lucent. Lucent spun off its enterprise arm as Avaya in October, and quickly distanced itself from the new company, with Avaya going public shortly after the spinoff announcement. Unlike the

restructuring Cabletron went through, 3Com announced it was exiting the large enterprise market altogether. Unlike 3Com, Cabletron has managed to avoid huge losses and layoffs, Patel says.

But everything has not gone according to Cabletron's master plan, however. When the restructuring was announced, four

now. I hear more from Aprisma when new products and updates come out." Lalomia attributes this to each company being more accountable for its business than before.

"I haven't noticed any problems" since the breakup, says Henry Perry, head of technology at Boston College. Perry has been a longtime user of Cabletron LAN switches and has recently installed wireless LAN equipment from Enterasys. He says when the transformation happened, he and Enterasys representatives met extensively to answer his questions and outline the company's plans.

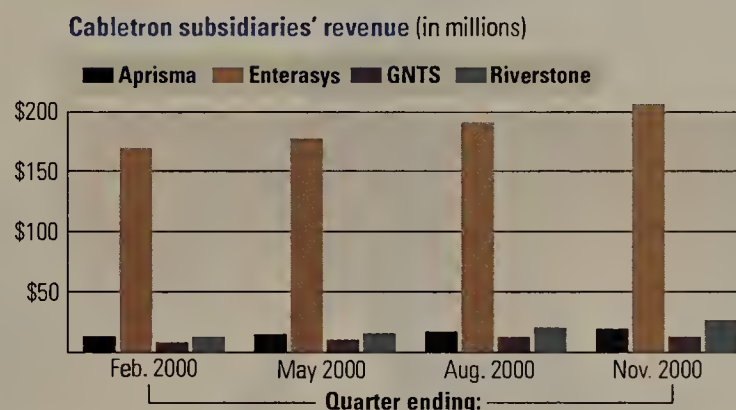
The breakup was also beneficial for retaining key employees, while allowing technologies and resources to be shared by the new subsidiaries, says Joel Conover, an analyst with Current Analysis. Specifically, switching technology and personnel from Cabletron's acquisition of start-up YAGO

Systems in 1998 has been beneficial for Enterasys and Riverstone. This is because YAGO's hardware technology is used in both companies' products, and Patel was the former CEO of YAGO.

"The YAGO group was the best thing Cabletron ever bought into. It's been a big asset for Cabletron. I know they held on to a lot of that technology" at Enterasys and Riverstone, Conover says. "Part of the reason they reinvented themselves was to hold on to those people and that technology." ■

### Sons of Cabletron

Each of Cabletron's subsidiaries has fared well since the company split itself into four parts last February.



IPOs were mentioned as the ultimate goal of the split. So far, only Riverstone has filed for an IPO, but the company and its underwriters are holding back the completion of the IPO while the market remains unfriendly to most technology stocks.

"Our plan continues to be to bring these four companies an IPO and to do a 100% spinoff in [the] marketplace," Patel says. "That's still the plan."

He says the outlined 18-month timeframe for spinning off each company is still reachable, depending on market conditions.

"We're still on track to be able to do it. I just wish the market had cooperated a bit more than it did," he says. "All four companies are absolutely ready to do an IPO. There is nothing internally stopping any one of the companies."

So far, some ex-Cabletron users have enjoyed dealing with the new companies.

Carlo Lalomia, CTO of Intellispace, a New York ISP, says his dealings with Aprisma and GNTS have improved since the breakup, although he was skeptical at first.

"Initially, we said this would be a mess," Lalomia says. "But that didn't happen. [Cabletron] did everything very clean. . . . I'd say we get better service

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## SPINNING OFF

Read more about how Cabletron's YAGO Systems morphed itself into the IPO-positioned Riverstone Networks and passed along a CEO to boot.

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Tolly on Technology . Kevin Flood

## Infrastructure

# THE FORGOTTEN SIDE OF NETWORK SECURITY

**W**ith network security, thoughts quickly turn to hackers, viruses, Trojan horses, denial-of-service attacks and other perceived threats.

However, after products are developed and deployed to minimize risk and vulnerability, we may find that we are our worst enemy. Not that we left a gaping

hole in our security defense but quite the contrary. The products may be sound from a security perspective, but might fail to include provisions to preserve

adequate business functionality.

With increasing volumes of business traffic traversing the Internet, implementing security at the edge of the corporate network is a given. But the too-often-assumed outcome is that our security package will address the vulnerability and leave all other features intact. The reality is that security touches almost every aspect of the business operation. Failing to account for the effect of security processes on business can result in unacceptable performance of networked applications, lead to scalability issues, and create impasses when implementing new technologies.

Consider line-of-business applications delivered using thin-client technology. With sufficient bandwidth and controlled latency, organizations can rely on the Internet to transport their server-based applications to remote offices and mobile workers. But it's the Internet, so all we have to do is introduce firewalls to filter intrusion and VPNs to protect data, right? Unfortunately, doing so could easily bog down the performance of those applications to the point where user sessions frequently drop and task execution proceeds at a snail's pace.

Recent testing conducted as part of Tolly Research's ITclarity research program proves this point. Using security appliances designed to support thousands of simultaneous sessions and Fast Ethernet connections, we observed excessive increases in application response times. With 80 or fewer simultaneous thin-client sessions, basic firewall and VPN functions increased response times as much as threefold.

For end users, that means waiting for application menus to appear after each click and tolerating substantial delays between text entry and display. In general, response-time fall-off of that magnitude translates into reduced productivity and lower effectiveness.

Hand-in-hand with application performance is scalability. Enterprise security products designed for many users and line-rate performance at speeds greater than T-1 may live up to their billing when used predominantly for filtering Web traffic. But introduce time-sensitive IP telephony sessions, and the specs for delivering acceptable voice quality or even achieving call completion can change substantially.

The challenge for IT when considering enterprise network security is to maximize business features. This includes managing security risks, and keeping in mind the impact on business operations. Successful network security architectures and policies will maintain adequate performance of networked applications, account for foreseeable scalability, and incorporate flexibility to integrate new applications.

*Flood is senior vice president of Tolly Research. He can be reached at [kflood@tollyresearch.com](mailto:kflood@tollyresearch.com).*

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# Carriers & ISPs

The Internet, Extranets, Interexchange  
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## Briefs

**Verizon Wireless** last week announced its Mobile Messenger service that lets users send and receive text messages using wireless handsets. The service is available in more than 200 cities, including Boston, Chicago, Dallas, New York, San Francisco and Washington, D.C.

Customers pay \$3 per month for 100 messages or \$8 per month for 600 messages sent and received. This cost is on top of their standard monthly service agreement.

Verizon Wireless: [www.verizonwireless.com](http://www.verizonwireless.com)

**Vitts Networks** is not closing up shop as the company had announced recently. The Manchester, N.H., competitive local exchange carrier, which serves more than 20,000 customers in New England, now says it has obtained enough funding to continue operating past Feb. 28, the date the firm had given as its last day.

Vitts' Web site is back up, and the company says it will continue to seek funding that would allow it to stay in business long-term.

Vitts: [www.vitts.com](http://www.vitts.com)

**Global Crossing**, the multinational service provider that is building a fiber-optic network around the world, recently announced it has completed another large network segment. The carrier's network now connects the U.S. and Mexico to Central America and the Caribbean. This segment is called the Pan-American Crossing.

The network, which will comprise 100,000 route fiber miles and connect 27 countries, is expected to be completed midyear.

Global Crossing: [www.globalcrossing.com](http://www.globalcrossing.com)

## Spectrum auction exceeds expectations

BY DENISE PAPPALARDO

**W**ith the imminent rise of third-generation wireless standards, established service providers and start-ups have demonstrated a willingness to empty their pockets for spectrum licenses in prime markets such as New York, Los Angeles and Chicago.

The Federal Communications Commission's latest wireless spectrum auction, which ended late last month, netted a surprisingly hefty \$17.6 billion.

Verizon Wireless, VoiceStream and Cingular Wireless — SBC and BellSouth's wireless joint venture — were among the bolder auction participants. Alaska Native Wireless, a cooperation of Native American-owned companies that are partnering with AT&T, was one of the most active entrepreneurial companies.

Most industry watchers estimated that the FCC's auction would bring in about \$15 million, says Eugene Signorini, analyst at the Yankee Group.

Verizon Wireless showed that it was not going to allow another service provider into New York, where it is a market leader, Signorini says. The company is spending \$2 billion on licenses in New York alone.

Wireless service providers are also

### Wireless auction closes

Here are some statistics about the PCS auction.

Net auction proceeds: **\$17 billion**

Largest bid for single market: **\$2.1 billion**

Market with highest bid: **New York**

Company that invested the most: **Verizon Wireless**

Number of licenses available: **422**

Auction dates: **12/12/00 to 1/26/01**

more concerned than anticipated about having enough spectrum to support 3G services. Although the FCC is planning another spectrum auction this year, Signorini says it may not take place as soon as was originally expected.

The FCC was scheduled to auction off the 700-MHz wireless bands in March, but announced last week that it is postponing the auction until September 12. This is not the first time the FCC has delayed the auction — the licenses were originally set to be auctioned off last September — but it's not surprising the

process has been postponed yet again. Issues such as existing television companies using the spectrum are still lingering, Signorini says. And wireless service providers that were betting on beefing up their networks with 700 MHz spectrum have lost confidence in the FCC's ability to get that auction off the ground.

No provider wants to be left behind when it comes to keeping up with 3G deployment. There isn't a set amount of spectrum that a provider absolutely needs to support 3G, but 15 MHz to 30 MHz seems to be the range that many are striving for. The 3G services will allow users to send wireless data transmissions at up to 384K bit/sec and increase the battery life of most handsets.

Verizon Wireless won two of the three PCS spectrum licenses in the New York area. Alaska Native Wireless nabbed the other. Verizon is spending \$8.8 billion for spectrum in Los Angeles, Chicago, San Francisco Philadelphia, Boston and Washington, D.C.

Alaska Native Wireless is spending \$2.9 billion for licenses in New York and Los Angeles. And Salmon PCS, a partnership between Cingular Wireless and Crowley Digital Wireless, is spending \$2.3 billion for licenses in Boston, Dallas and Los Angeles. ▀

## RBOCs report strong demand for DSL services

*SBC Communications adds more than 250,000 new lines in the fourth quarter.*

BY MICHAEL MARTIN

Year 2000 DSL numbers for the regional Bell operating companies are finally in. The common thread? Explosive growth.

SBC ended the year with about 767,000 subscribers, Verizon with 540,000, Qwest with 255,000 and BellSouth with 215,000. In the fourth quarter alone, SBC added over 250,000 subscribers.

According to statistics from TeleChoice, at the end of 1999 all incumbent local exchange carriers (ILEC), including the RBOCs, had deployed 386,000 DSL lines. By the end of 2000, there were more than two million ILEC lines installed.

The RBOCs' largely residential asymmetric DSL customer bases dwarf those of the data LECs, which provide mostly business-class symmetric DSL lines. Covad finished 2000 with about 275,000 cus-

tomers, NorthPoint with 100,000 and Rhythms with 67,000.

Adam Guglielmo, an analyst with consultancy TeleChoice, says the RBOC numbers are about what his firm expected.

SBC fell well short of its stated target of one million lines by the end of 2000, but Guglielmo says missing the million mark shouldn't be taken as a sign of weakness.

"They might have said they'd have one million, but that doesn't mean we believed that's what they'd get," he says.

Guglielmo expects the RBOCs' DSL numbers to continue to rise, driven by increasing awareness of DSL technology and the spread of self-installable DSL kits, which don't require service providers to send a technician to a customer's site.

Video over DSL and voice over DSL should also become more widespread

this year, he says.

Although Guglielmo expects RBOCs will begin to sell business-class DSL designed for small and midsize businesses, he says their focus should remain on the residential market. ▀

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Eye on the carriers . David Rohde

## TIE YOUR BUNDLE WITH SCOTCH TAPE AND STRING

**T**he original idea behind AT&T's four-way breakup announced last fall was to let stockholders better realize the value of each separate business.

But new information suggests another reason for the move: AT&T could never integrate its disparate telephony, data and cable offerings.

To get a look at some of the chilling stories behind AT&T's mass-market integration efforts under CEO Michael Armstrong, go to the AT&T Insider Web

site and see a report called "Bungling on Bundling at AT&T" ([www.attinsider.com/bungling\\_bundling.asp](http://www.attinsider.com/bungling_bundling.asp)).

AT&T Insider is run by the firm's principal labor union, the Communications Workers of America. CWA is opposed to Armstrong's plan to split AT&T into business, consumer, cable and wireless units. Its reasons include the multibillion-dollar debt that Armstrong is proposing to load onto the consumer tracking stock, and the perception that separate companies will have an easier time shifting work to contractors. So CWA has a vested interest: It's campaigning to get AT&T shareholders to reject Armstrong's plan.

But CWA members are on the front lines of consumer complaints, so it's worth listening to what they have to say. Here are three examples:

- Customer reps manning sales lines can add ordinary local telephone service to long-distance accounts, but that's about it. "The AT&T call centers that handle long-distance cannot handle wireless, cable or Internet access sales," the report says. AT&T eventually dropped wireless and WorldNet dial-up Internet access from a bundled consumer offer called AT&T Personal Network.

- Small-business customers are supposed to get outbound long-distance, 800 and calling cards bundled with wireless call details onto one bill. But in some call centers handling this plan, service reps couldn't find the wireless portion of the bill on their PCs. "Finally, AT&T installed a second computer at the workstations of some of these employees, giving them access to the AT&T wireless systems." Even at that, "AT&T never trained them on the wireless system or billing plans."

- Some people ordering cable telephony have been caught in a vicious circle owing to poor back-office integration. This AT&T unit's billing system is based on the installation due date, so when telephony installation appointments were canceled, cable customers got billed for telephone service anyway. But when they complained, the only way reps could stop the billing was to change the due date. That action could effectively cancel the order.

CWA says AT&T has "failed to invest in the human and technical resources" needed for integration and should do so instead of breaking itself up.

I might draw a different conclusion: Bundling for its own sake is a red herring, and carriers should win customers via better features and prices, not superficial packaging.

Under that logic, maybe CWA is unwittingly endorsing Armstrong's plan by exposing an uncomfortable truth: AT&T never really built a bundled business in the first place.

*Robde is managing editor of The Edge section of Network World. He can be reached at [drohde@nww.com](mailto:drohde@nww.com).*



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# Managed services moving more international data

BY DENISE PAPPALARDO

Selecting a service provider to handle your company's international data communications requirements can be an overwhelming chore.

As the largest companies in the world set up e-commerce and industry-specific electronic exchanges that span many borders, more users will be faced with this daunting task. Consulting firm Giga Information Group predicts that by the end of 2003 at least 42% of global 2000 companies will be buying fully managed data services. Today, only about 12% of the largest companies in the world are buying such services, says Brownlee Thomas, a senior analyst at Giga.

"These companies are selectively outsourcing parts of their wide-area network services," Thomas says. To expand a frame relay network overseas, a typical company will need to dedicate 80% of its IT staff to the project. Most companies cannot afford that manpower, which is why it makes more sense to use managed service offerings overseas when possible, she says.

There are a handful of newcomers entering the international scene offering dedicated IP, frame relay and ATM, and other fully managed services. They include Global Crossing, Vodafone and KPNQwest. There are also a handful of established international service providers that fall into the same realm, such as WorldCom, Infonet, Cable & Wireless, Equant, AT&T and British Telecom's joint venture Concert, and France Telecom's Global One. France Telecom is also in the process of buying Equant, which will be merged with Global One.

## No obvious choice

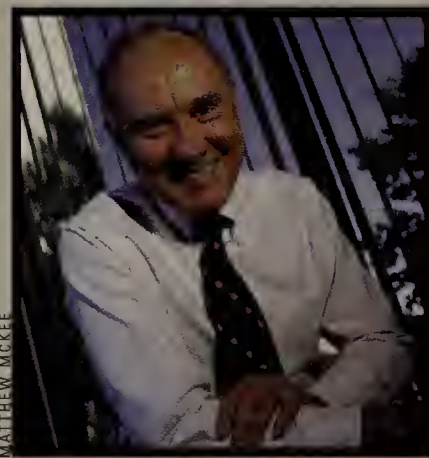
It's not easy for users to choose an international service provider, because they can't simply pick one that has the most diverse service offerings or is the market leader. No single provider covers 100% of the globe, and no one has broken from the pack in terms of market share. Each established international service provider has service revenue hovering in the \$1 billion to \$1.2 billion range for 2000, except for Infonet, which has revenue of about \$500 million.

Instead of focusing on market leaders, users should shop based on a combination of factors, including a provider's geographic reach, service variety, overall cost, level of expertise, network performance and support policies, Thomas says.

State Street Bank's top priority was finding a limber provider when it started shopping for a new international service. Three years ago, State Street issued a "request for information" to several international telecommunication service providers to

## INTERNATIONAL DATA NEEDS

**Complex set of factors play into choosing the right providers.**



MATTHEW MCKEE

**"The biggest benefit is we can aggressively seek out international opportunities without the risk of paying for a fixed network."**

Gary King, senior vice president, State Street Bank

connect more than two dozen sites overseas with the company's headquarters in Boston. State Street was looking for more than straight frame relay connectivity; it wanted flexible pricing, says Gary King, senior vice president at the financial institution. Equant was the only provider that stepped up to the plate, he says.

## Sliding scale pricing

State Street negotiated a sliding scale pricing program with Equant-based aggregate traffic sent per month. "As the volume of traffic goes up, the marginal price declines," King says. "The biggest benefit is we can aggressively seek out international opportunities without the risk of paying for a fixed network."

Typical frame relay networks require users to pay a port charge and a committed information rate (CIR) for each site connected to the network. State Street essentially eliminated the CIR charge.

State Street pushed beyond the standard "brochure ware" to craft a service that best suits the company's needs. The financial institution was able to make this happen by negotiating with the carrier's engineering staff in addition to the sales and marketing teams.

The company has a diverse 2M bit/sec pipe from Boston to its major facilities overseas. The undersea cable connects State Street headquarters with three Equant international points of presence (POP). The

POPs are directly connected to the carrier's network that supports IP, ATM and frame relay in 220 countries. State Street is connecting 27 remote offices over Equant's network.

"After a long courtship, we started to make a major shift in our international strategy about two years ago," he says.

## Use multiple service providers

But King is not a believer in the one-stop shopping model that many service providers tout these days. While the majority of State Street's data flows over Equant networks, the company is also using international services from AT&T and WorldCom in select cities. State Street also has ISDN backup set up for most points on its frame relay network.

Other users are waiting for international services to catch up with domestic offerings.

"We're interested in two upgrades for our European operations," says Robert Krestakos, director of IS at Steelcase, a Grand Rapids, Mich., office furniture manufacturer. The company wants to upgrade the bandwidth between its Grand Rapids and

Strasbourg, France, headquarters, while also upgrading 30 remote offices overseas to AT&T's Integrated Network Connect Service (INCS). But both upgrades are on the back burner.

Steelcase started rolling out AT&T's INCS service last year to its regional offices around the U.S. Today, the company has six sites up and expects about 30 domestic offices will be upgraded to INCS within the next year. INCS is an integrated access service that dynamically allocates the bandwidth of a single T-1 for voice and data traffic.

Today, the service is limited to a single T-1 and is not offered overseas. Steelcase has a standard T-1 between the company's domestic and international headquarters and a frame relay network that connects its 30 European offices.

"Our current setup is meeting our needs, but we can see a time when it won't," Krestakos says.

AT&T has not announced when it will offer INCS services that support bandwidth above 1.544M bit/sec or when INCS may be available internationally.

As more service providers try to break into the international service provider arena, businesses should have more flexibility when it comes to tweaking services to suit their business practices. Users need not settle for the standard offering, but instead can prioritize their requirements and seek out a provider willing to work toward a common goal. ■



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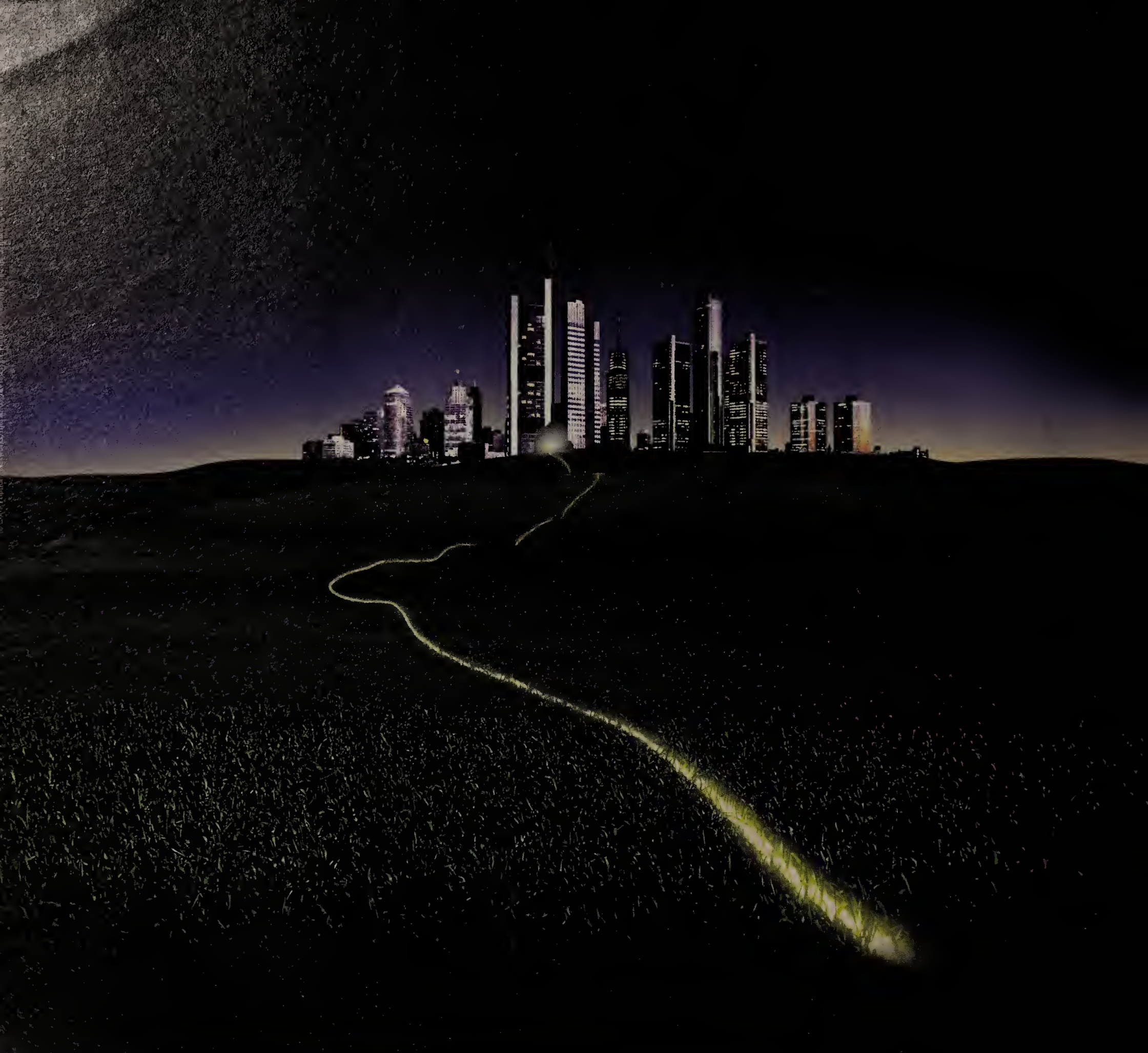


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# The Edge

Service provider developments at  
the juncture between the enterprise  
and the new public network

## Briefs

Rapid5 Networks last week introduced the RCP-700 Rapid Convergence Platform, which provides Internet traffic offload, multiservice gateway functionality and broadband access concentration. Among other capabilities, the RCP-700 intercepts and packetizes data traffic before it hits a Class 5 telephony switch, providing relief from long-hold Internet dial-up connections. Rapid5 is targeting major incumbent local carriers with NEBS Level 3 and other certifications, and an open softswitch interface to accommodate products from multiple softswitch vendors.

The RCP-700 is slated for commercial delivery around midyear.

Rapid5: [www.rapid5.com](http://www.rapid5.com)

Sen. John D. Rockefeller IV (D-W. Va.) led a bipartisan group of 30 U.S. senators in introducing a bill providing a tax credit equal to 10% of a carrier's investment in equipment used to provide broadband services to business or residential customers in rural and low-income areas.

The proposal, called the Broadband Internet Access Act, would apply to services carrying at least 1.5M bit/sec downstream and at least 200K bit/sec upstream, roughly paralleling the capabilities of asymmetric DSL. The bill has been referred to the Senate Finance Committee, and the Bush administration so far is noncommittal.

The National Convergence Alliance (NCA) has issued a call for white papers on IP billing and related matters. Apogee Networks of Saddle Brook, N.J., is chairing the NCA's IP Billing Committee. For more information, see [www.ConvergenceAlliance.com](http://www.ConvergenceAlliance.com).

## Looking to smooth out DSL delivery

*Virtual Access hopes to improve wholesaler/reseller relationship.*

BY MICHAEL MARTIN

Virtual Access is aiming to solve the thorny issue of identifying and resolving problems in DSL networks without involving the DSL wholesaler.

The Ascot, England, firm's recently announced DSL Service Managed Gateway is designed to let DSL resellers manage their customers through a browser-based interface. The Service Managed Gateway is being sold to wholesalers that would make the platform's management capabilities available to their resellers.

"There are some real issues between the DSL wholesaler and the DSL reseller," says Philip Smith, director of sales development at Virtual Access. "The customer is owned by the reseller. But if a customer comes to a reseller with a problem, the reseller has to determine if the problem is on the reseller's end or on the wholesaler's end. This often isn't easy to determine."

Some DSL equipment vendors have tried to resolve the problem by installing diagnostic tools within DSL access multiplexers (DSLAM). Smith says this doesn't

### Simplifying DSL delivery

Products from Virtual Access — Service Managed Gateway and the Activator management platform — let ISPs troubleshoot DSL deployments with no wholesaler intervention.



help much because the DSLAM is owned by the wholesaler and can't typically be accessed by the reseller.

So Virtual Access has taken a different approach and embedded management functionality within the customer premises equipment (CPE).

The approach depends on three elements: the CPE, known as the Service Managed Gateway; Service Managed Servers, which reside at the central office and handle traffic aggregation and quality of ser-

vice; and Activator, a service controller, which handles flowthrough provisioning and gives the reseller a management interface. By using these elements, a wholesaler can give resellers proactive alerting and diagnostic tools in the form of Java applets. The tools include spectrum analysis components that would normally be available only through a protocol analyzer, he says.

If a problem in the DSL network means  
See **Virtual Access**, page 34

## ASC adds management to access aggregation

BY DAVID ROHDE

VIENNA, VA. — Broadband multiservice access vendor Advanced Switching Communications has introduced an element management system that aims to integrate with myriad other devices in service provider networks.

ASC's rackable and chassis-based boxes take in a diverse stream of access traffic and often act as second-stage aggregation of T-1 lines, DSL and other streams onto carrier ATM backbones.

Because these devices can be placed anywhere from in-building wiring closets to carrier super points of presence, ASC is targeting the new management platform, called ASCmanager, to integrate with many other operations and support services (OSS) products in service provider nets.

The ASCmanager software provides fault management, configuration, accounting, performance and security network management of products ranging from

ASC's 24-port A-1240 pizza-box-sized aggregator to its chassis-based A-4000 supporting up to 392 T-1 equivalents.

ASCmanager operates on Sun's SPARCstation server supported by an Oracle database, with either SPARCstation or Windows 2000 client stations. It's the successor to ASC's existing Web-based manager and command-line interface housed within each ASC network element, which ASCmanager can also access.

ASC's object-based data model is designed to support interfaces based on Common Object Request Broker Architecture for integration with other OSS systems. For carrier network administrators, ASCmanager uses autodiscovery features that display ASC switches and their configurations in a topological map.

Part of the goal is to enable carriers to manage all aspects of multiple ASC platforms as a single virtual node, says Larry Kraft, ASC vice president of marketing. That's key as ASC seeks customers among

large incumbent local exchange carriers to add to its base of ISPs, competitive local exchange carriers and others.

ASCmanager costs \$20,000. ■

[www.nwfusion.com](http://www.nwfusion.com)

## MAPPING OUT SERVICE

The TeleManagement Forum Web site is packed with information on standards-based OSS, and includes a strategic guide and business framework for the automation process. Check out the hypertext version of the Telecom Operations Map.





A close-up portrait of a middle-aged man with a friendly smile, wearing a light-colored suit jacket, a light blue shirt, and a dark tie. His hands are clasped together in front of him, and he is wearing a gold ring on his left ring finger. The background is a solid light blue.

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# Redback offering aims to reduce 'time to service'

*SmartEdge 100 — a scaled-down version of the SmartEdge 800 — moves metropolitan access closer to the edge.*

BY JIM DUFFY

SUNNYVALE, CALIF. — Redback Networks last week unveiled a low-end version of its metropolitan optical access platform designed to let service providers extend services downward into multitenant buildings and other metropolitan edge environments.

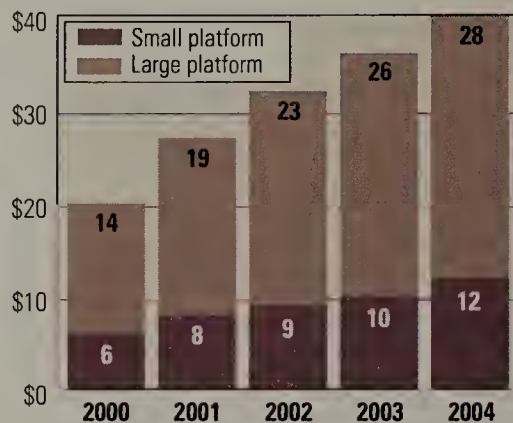
The SmartEdge 100 is a scaled-down version of Redback's SmartEdge 800, an optical provisioning platform for the metropolitan core that resulted from Redback's \$4.3 billion acquisition of Siara in late 1999. The SE 800 is designed to help service providers reduce the "time-to-service" interval of SONET networks.

The SE 100 is based on the same ASIC technology as the SE 800 and can interoperate with the higher-end product, according to Redback. It supports

## No lack of access

**The market for metropolitan optical access platforms is expected to double by 2004, according to market tracker RHK.**

**Metropolitan optical access platform market (In billions)**



SOURCE: RHK, Redback Networks

time-division multiplexing and packet technology for the provisioning of existing TDM and

over-SONET interfaces. Individual cards sport three OC-48 ports, six OC-12s, 12 OC-3s, 12

newer IP-based services.

The SE 100 is an eight-slot chassis that is three rack-units high. The chassis houses cross-connect and control modules, an alarm card for system management and an array of universal service cards.

The universal service cards support DS-1/E-1, DS-3/E-3, 10/100M bit/sec Ethernet, Gigabit Ethernet, and OC-3, OC-12 and OC-48 packet-

DS-3s, 21 DS-1s or 48 10/100M bit/sec Ethernet interfaces.

Competitive offerings support only one OC-48 or OC-12, three DS-3s or eight 10/100M bit/sec Ethernet per card, Redback says. They are also eight rack-units high, a situation that may discourage space-constrained service providers.

Redback acknowledges that some competitive offerings, such as those from Cisco, Lucent and Nortel, sport seven more DS-1s per card than the SE 100.

Other features of the SE 100 include "carrier-class" redundancy and programmable ASICs that can dynamically select TDM or packet services, Redback says.

"A single physical port can even furnish both TDM and IP termination simultaneously through channelization," market tracker Current Analysis wrote in a report. "These capabilities

allow the SmartEdge to collapse the functionality of multiple network elements, including SONET add/drop multiplexers and cross-connects, into a single integrated platform."

Nonetheless, Redback faces formidable competition in the crowded optical access market from established players such as Cisco, Nortel and Lucent, and a host of aggressive start-ups, Current Analysis said. This, coupled with the lack of product-line breadth in core routing, optical core and voice, will make market penetration a challenge for Redback, the firm said.

Currently in beta testing, pricing for the SE 100 was not disclosed by press time. ■

## Virtual Access, continued from page 31

a customer can't get a connection, the reseller can still link to the customer through a redundant dial-up connection in the Service Managed Gateway.

The Service Managed Gateway costs about \$600. Wholesalers also pay a license fee for Activator based on the number of customers. For a base of 80,000 to 100,000 customers, the fee would be about 25 cents per customer, per month.

The Service Managed Gateway will work with any DSLAM and is available in asymmetric DSL, ISDN-based DSL, symmetric DSL and very-high bit rate DSL flavors.

Matthew Davis, an analyst with The Yankee Group, says several companies have been working on products to improve the reseller/wholesaler relationship.

"There's been a challenge in being able to track down problems between the DSL reseller and the [competitive local exchange carrier] wholesaler and between the wholesaler and the [incumbent local exchange carrier]," he says.

Davis says no vendor seems to have an all-in-one solution.

"It comes down to whether you want a dumb device at the edge and manage it all centrally, or whether you have more intelligence at the edge and pay a bit more," he says. ■

# Emperative looks to speed provisioning of optical circuits

BY TIM GREENE

WALTHAM, MASS. — Emperative is taking its expertise provisioning DSL services into the optical arena, where it hopes to speed service-delivery times.

The company this week will introduce ProvEn Optical software it claims can provision optical circuits within 15 minutes across networks that are built of equipment made by multiple vendors.

With ProvEn provisioning these services, customers will get new circuits faster than they would if each device was provisioned by a separate management platform. ProvEn will let service providers offer customers the option to set up their circuits as they require more bandwidth, says Abraham Gutman, CEO of Emperative.

"This will give us faster provisioning than we are getting now, and that is what carriers' customers want," says Michael Allen, an analyst with the Aberdeen Group.

Service providers could

write their software to integrate multiple vendors' individual management platforms into a single overarching provisioning application, Allen says. But it is likely much easier and cheaper to buy software like ProvEn, he says.

The value of ProvEn lies in managing enough vendors' gear so it can provision services in a real-world, multivendor network. Initially, ProvEn will support gear made by Redback Networks and Ciena. Later, the company plans to announce support for Nortel, Cerent and Cyrus, which was recently bought by Ciena.

Optical vendors, such as Sycamore Networks, are developing software that will provision circuits across networks, but those networks must consist of that vendor's equipment.

For most of its two-and-a-half-year history, Emperative has made ProvEn for broadband access services such as DSL and cable modem Internet access. But optical vendors sought a similar application for their equipment, Gutman says.

### Emperative provisions optical gear

Emperative's ProvEn Optical provisions network optical gear made by multiple vendors from a single software platform.


ProvEn is Java-based and talks directly to devices in the network, to the element management systems of devices or to the network management software written by the device makers, Gutman says.

ProvEn is available now and


is sold based on the number of devices in the network. Customers pay \$200,000, plus about \$25,000 for core switches and routers, and about \$5,000 for edge devices.

Emperative: [www.emperative.com](http://www.emperative.com)






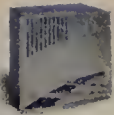
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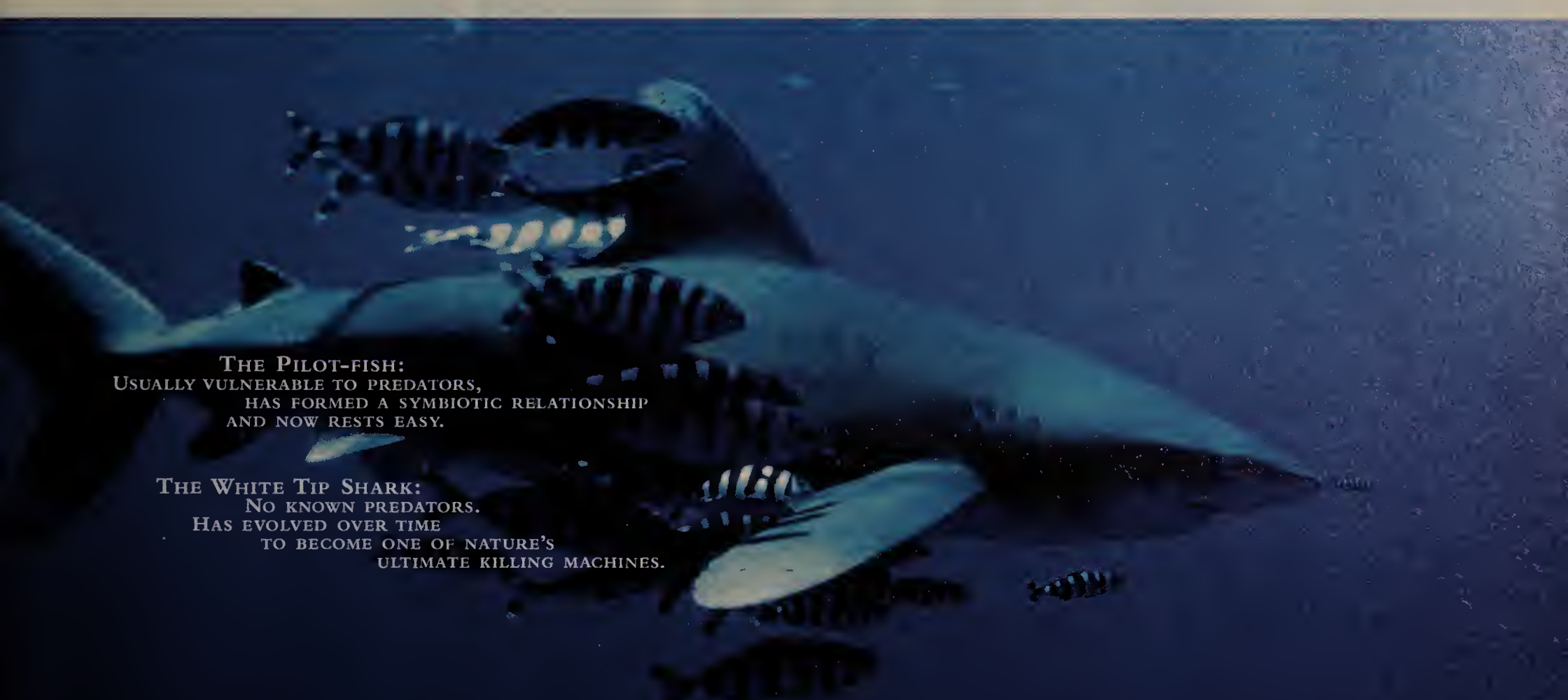
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## Briefs

Users of Hummingbird's enterprise information portal (EIP) will soon have the ability to send secure e-mail with a click of the mouse, thanks to a strategic alliance between the software maker and ZixIt, an e-mail security service provider. Company officials couldn't say when the service would be available, but they are now integrating ZixIt's ZixMail product into Hummingbird's EIP. The EIP lets companies organize internal and external business information through single-point entry to databases, e-mail servers, search and knowledge-management tools, and other resources. With ZixMail, users can send encrypted and digitally signed e-mail to anyone with an e-mail address. Recipients who also have ZixMail get the message delivered directly to their inboxes, while those without ZixMail are sent a hypertext link to connect to the message, which is read over an SSL connection.

Hummingbird: [www.hummingbird.com](http://www.hummingbird.com)

Computer Associates last week released the latest version of its Unicenter TNG Asset Management Option with added support for wireless and mobile devices from Microsoft and Palm. Version 3.1 of the software discovers networked devices and reports inventory to network professionals. It is installed on a server. When users log on, an agent is sent to each device, where it assesses the configuration and applications on that PC or handheld. If anything varies from rules set by the net manager, the agents reconfigure the device or desktop to predefined standards. The release supports Linux, mobile Windows devices such as the Pocket PC and the Palm operating system. Version 3.1, available now, starts at \$2,500.

CA: [www.ca.com](http://www.ca.com)

## Start-ups vie to defeat DoS attacks

BY ELLEN MESSMER

Nobody's claiming it's easy to prevent and stop denial-of-service attacks, but three security start-ups are vying to prove that they can minimize the threat.

If they succeed in developing monitoring gear to fend off denial-of-service attacks, businesses on the Web will benefit because ISPs today have little or no equipment that can automatically detect the serious denial-of-service IP floods that are slowing down or — as Microsoft recently experienced — completely paralyzing e-commerce operations. The start-ups — Mazu Networks, Arbor Networks and OneSecure — are developing the kind of monitoring devices that help ISPs help their customers.

Based in Cambridge, Mass., Mazu this spring will be field-testing its yet unnamed denial-of-service monitoring equipment in ISP networks and in front of Web servers to sense the first signs of an attack and coordinate an automated response to filter "bad" traffic.

Mazu CEO Phil London says the moni-

toring devices are meant to stop distributed denial-of-service attacks, the devastating type of assault in which a single attacker can remotely control the launch of massive IP floods through agent "zombie" code installed on thousands of com-



PATRICK O'CONNOR

**"The goal is to figure out what's 'good' traffic and 'bad' traffic."**

Phil London, CEO, Mazu Networks

promised servers on the Internet.

"The goal is to figure out what's 'good' traffic and 'bad' traffic," London says. "Our devices will be analyzing packets at line speed, gigabit speed." Based on a statistical model of traffic patterns, the Mazu equipment will be able to identify traffic characteristics of distributed denial-of-service attacks and communicate that information to the ISPs, Web-hosting centers or Web server owner via a private network or dial-up.

The devices will be able to take active response measures, such as filtering and tracing the attack, and gathering forensics, London says.

The gear is just going into field tests. It will be several months before Mazu, which has gotten \$8 million in funding from Benchmark and employs 30, has test results to disclose.

Competitor Arbor Networks of Waltham, Mass., also hopes to help ISPs stop attacks. It has received \$11 million in funding from Battery Ventures and Cisco.

The company is building Pentium-based monitoring equipment that will collect

See DoS, page 38

## HostPro offers dedicated hosting in a shared package

BY JENNIFER MEARS

LOS ANGELES — Aiming to meet the needs of businesses that want the control of dedicated servers, but without the cost, HostPro last week rolled out a Web-hosting product it says provides the best of both worlds.

HostPro Freedom is a variation of HostPro's virtual shared hosting offering. In shared hosting, many firms' Web sites are hosted from the same server. Virtual shared hosting gives companies more autonomy by giving each Web site its own IP address, limiting the impact of activity from other Web sites hosted on the same server.

HostPro executives say Freedom, based on Unix, goes a step further and completely frees companies on a shared server from the limitations of a shared environment. They say the HostPro technology lets each customer sharing a server have its own operating system, meaning the customer can add or remove applications, make changes to system files, issue passwords and define access rights — the same flexibility typically found with dedi-

cated server hosting.

"This is a good midrange product for companies that are not quite ready to move on to a more sophisticated product," says Helen Chan, an analyst with The Yankee Group. "This is a good migration pattern for them to move up that curve without necessarily spending 10 times more than what they're used to spending each month."

Chan says it's the first Web-hosting service she's seen that gives shared server users such extensive control.

Derek Alfonso, founder of eRealty.com, an online realtor, says HostPro lets him administer his Web site exactly as he wants. "I have more power, without more cost, than I thought possible."

Chan says Freedom gives HostPro a competitive edge, but notes it's geared toward HostPro's typical customer base, which includes Web developers, value-added resellers and other technically sophisticated users. "If you were a small business, Mom-and-Pop shop, you wouldn't know what to do with this full root access capability," Chan says. "And it can

really wreak havoc for a customer if that customer doesn't know what he's doing."

The pricing for Freedom ranges from \$59.95 to \$249.95 per month. All offerings include e-commerce software and a range of other preconfigured applications.

HostPro: [www.hostpro.com](http://www.hostpro.com)

[www.nwfusion.com](http://www.nwfusion.com)

### SECURE YOUR KNOWLEDGE

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'Net Insider . Scott Bradner

## TALKING TO A MIRAGE?

**S**ecurity is expensive. It's expensive in terms of complexity, management and non-ease of use. It's also expensive in terms of the processing power required. But attempts to minimize the impact of the latter on Web servers are now affecting the very security that is being sought.

Web security is pretty good stuff. The basic idea is that you want to set up secure communication between yourself and a server that you are sure is the right one. At the same time, the server wants to be sure that it's talking to you and not someone down the street.

The server has a digital certificate your browser uses to be sure it is communicating with the right server. You authenticate yourself to the server with your digital certificate or with a

logname/password combination. Thus, the server knows who you are. You, as a user, authenticate yourself to an authenticated server — just the right level to be securing — and the communication is encrypted — what more could you want?

By the way, I say Web security is at "just the right level" because the authentication is taking place at the user level and not the system level, as is the case with many VPN products and services.

VPNs can be used between firewalls, in which case the communication inside the firewalls is open to eavesdropping, and the identity of the servers and users is not assured. VPNs can also be used between remote computers and a firewall. The result here is not much different — insecure internal communications

and no server authentication. In addition, if the remote computer is compromised, the first line of corporate defense is breached.

But there is a disturbing, if understandable, trend that undermines some of the security of a secure Web environment. This is the movement to separate front-end processors that are used to off-load some of the computing-intensive work from the Web servers. These front-end processors mimic the server you're trying to connect to. They have a digital certificate for that server, so your browser thinks it's talking to the actual server. The front-end processor does the encryption and decryption, and communicates with the actual Web server using unencrypted datastreams.

Since this is all in a data center, one might think that it's all OK security-

wise. But it's not. The data is now exposed to eavesdropping, where it previously had not been.

Also, if the front-end processor is compromised, all the servers it fronts for are compromised. But more importantly, you as a user can no longer be sure what you are talking to. Transparent proxies, Network Address Translation systems and firewalls have already compromised the original end-to-end Internet model, and I guess this is just another little step along the path. But I don't have to feel good about it.

Disclaimer: Harvard's original model is long gone or this column would be more pious. But the university has not expressed a view on Internet transparency.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.*

## Active Navigation maps a path for Jane's visitors

BY JENNIFER MEARS

**SAN FRANCISCO** —Jane's Aerospace Managing Editor Simon Michell was facing a daunting task. Visitors to Jane's 20-plus electronic publication sites appreciated the wealth of defense, security and transportation information they found, but they felt overwhelmed by it.

It's a common problem as companies increasingly move information to the Web, giving employees and customers access to a range of resources through a single portal. The trick is to manage the data to make it easier to use. Analysts agree that as the portal market grows, so too will the demand for search and content management tools.

"It doesn't matter how great your technology is. If you don't have the content to put in the portal, the information people need, that can be put into a form they can use, then your technology does not do you much good," says Nancy Tubb, a senior analyst with the Delphi Group.

Jane's, a provider of print and online global defense information in England, turned to a company called Active Navigation to organize its content. Active Navigation implemented its Portal Maximizer for Jane's, and within a month had thousands of documents analyzed,

indexed and categorized without manual tagging or heavy coding.

The Portal Maximizer, unveiled last week, provides a browser front end, but works from the back end to categorize and index information, giving users links to information they may not have thought to look for themselves. For example, an internal memo referring to a

Active Navigation executives say they're approaching the problem of content management in a new way.

"Search, navigation, dynamic linking, related articles, they're all different ways to navigate information in a Web space," says CEO John Darlington. "Providing just one navigation mechanism is not the answer... We offer four or five."



**"The Active Navigation Portal Maximizer allows us to bring together all our content on the same subject in one easy interface. As Jane's has over half a million different document files, this is proving a very powerful tool."**

Simon Michell, managing editor, Jane's Aerospace

previous project would appear in an enterprise portal with links to the related document — and any other related information such as spreadsheets or news feeds — automatically inserted.

With Jane's Aircraft Fighter Online, portal visitors can navigate through more than 45,000 documents on specific aircraft types with just a few clicks.

"The Active Navigation Portal Maximizer allows us to bring together all our content on the same subject in one easy interface. As Jane's has over half a million different document files, this is proving a very powerful tool," Michell says.

The Portal Maximizer uses text analysis technology that employs linguistic and statistical techniques. The person in charge of the portal can define concepts and names, or the analysis can be done automatically. The information is automatically indexed and transferred into an XML document for integration with numerous apps and environments.

Active Navigation's Portal Maximizer runs on Windows NT and 2000, Solaris and Linux. The product is priced per server for portals and per seat for intranets, and the average cost is about \$75,000. ▣

**DoS,**  
continued from page 37

the output of Cisco and Juniper routers, but won't sit directly inline on the ISP networks in front of routers as a separate box, as the Mazu devices do, says Rob Malen, CTO of Arbor.

Capturing the data output that constitutes evidence of a denial-of-service attack is "a terribly manual process and it takes hours and days to do anything about it," Malen says. The Arbor equipment, expected in August, will be able to automatically detect, trace and filter "bad" traffic, says Ted Julian, chief strategist.

A third start-up, OneSecure, co-founded by Check Point Software's former chief architect, Nir Zuk, claims to have built an entire security network management package for ISPs. Its product is called the OneSecure Co-Management Platform and will be able to detect a denial-of-service attack and manage firewalls and VPNs.

"[Denial-of-service] attacks are getting worse every day," says Zuk, CTO at OneSecure. The Denver company also provides outsourced security through 30 engineers at its data center using the OneSecure platform. The cost is about \$2,000 per month, per device.

Such gear sounds promising, according to Amir Moujtahed, an executive at Costa-Mesa, Calif.-based ISP Epoch, but it would need to undergo extensive testing before being deployed.

"We'd look at such ideas, test them in our lab and see if there's buy-in for them from other ISPs," says Moujtahed, who added that ISPs are eager to coordinate to deal with the threat. ▣



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# Technology Update

An Inside Look at the Technologies  
and Standards Shaping Your Network

## E-comm needs real-time management

BY ASA LANUM

**T**raditional management tools that rely on postevent warnings just don't suffice in the real-time e-business world. By the time you're aware of a problem, your e-business customers are already gone.

What's needed is an early warning system that alerts you to potential service problems, even those caused by non-e-business processes running within your shared IT infrastructure.

In today's e-business infrastructure, problems can occur at any point across a transaction's critical path, in a single component or between multiple components. Yet traditional management tools are not designed to monitor this cross-component transaction flow, nor are they designed for real-time early warning.

But a new class of technology called real-time management makes it possible to monitor the flow of e-business transactions or information across networks, servers and applications in real time.

Real-time management systems (RTMS) require three elements: data collection, analysis and reporting.

● **Data collection.** These systems gather resource-utilization metrics of heterogeneous components across e-business infrastructures. Only after the data has been collected and analyzed can meaningful decisions be made about strategies for optimizing performance.

For example, with an online trading site you would have to collect data from many sources, including real-time stock quotes and customer portfolios stored in databases. To monitor service levels in real time, critical components — including network devices, Web application servers and transaction systems — must be monitored and input must be collected. Agents on each of these components gather critical information in real time and report it for simultaneous analysis.

An RTMS also interfaces with legacy management tools. Data collected from other vendor's products such as IBM Remote Monitoring, which measures utilization of mainframe resources, or NetScout's Ethernet Probes and Token Ring Probes, which provide network performance information, can easily integrate with the collected data of an RTMS.

An RTMS continuously monitors service and consumption metrics and sends details to a correlation engine. To do this effectively it must be able to aggregate large amounts of heterogeneous data,

and immediately analyze this heterogeneous base for trends, relationships or early warnings of service degradation.

● **Analysis.** Managing a complex IT infrastructure requires powerful analysis and correlation technology applied to the specific problems associated with e-business. Data is analyzed using statistical correlation techniques, identifying relationships and dependencies across the infrastructure that may have been unknown to the network manager. Once the analysis engine detects a negative trend, correlation capabilities can immediately diagnose its cause across all involved components.

value offered by an RTMS is a single interface to aggregated information regarding all of the components within the IT infrastructure and their behavior/performance. This consistent service-level interface enables administrators from different domains (NT, Unix, database, networks) to share common information, utilizing common terminology.

This provides a method for diverse personnel to quickly diagnose interdependencies across all components and domains, even those that are unfamiliar.

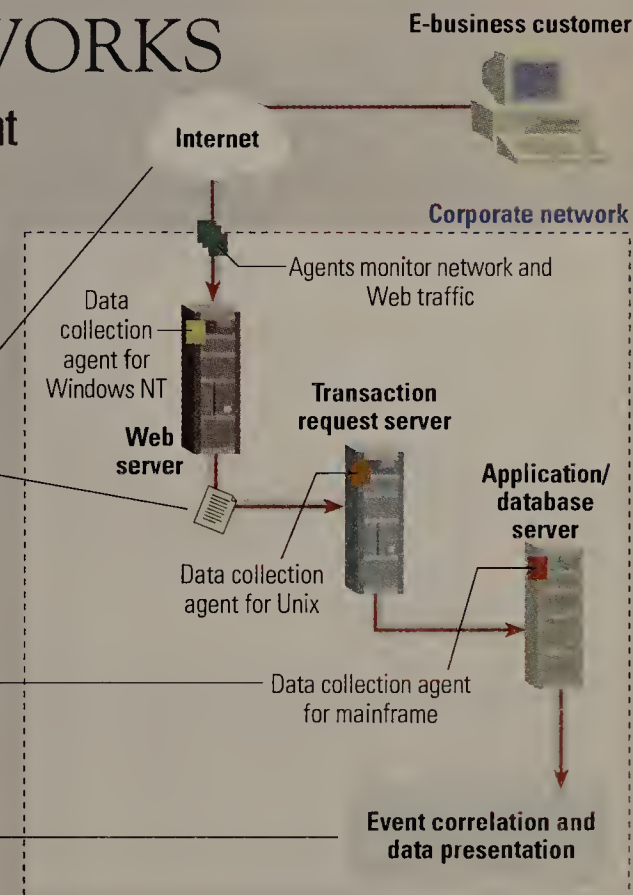
Ideally, an RTMS presents different views of information, depending on the

### HOW IT WORKS

#### Real-time management

Real-time management systems use data collection agents to deliver up-to-the-minute views of the overall health of networks.

- 1 In an e-business transaction, traffic moves across the server tiers and two network segments — corporate and the Web.
- 2 Data collection agents are deployed across all layers, components and platforms where information is aggregated and reported to event correlation software.
- 3 The correlation system discovers relationships between devices and discovers the root causes of problems.



Traditional network or systems management tools can then be applied to fix the problem.

For example, when a service-level change is detected, the immediate cause may point to a slow or saturated network segment. Traditional management would suggest adding network bandwidth to resolve the service degradation. However, by applying correlation across the critical path, the cause could be diagnosed as a database server running an unrelated backup application across that same network segment. By simply rescheduling the backup for off-peak hours, the e-business service level is assured for the long term.

● **Reporting.** Ultimately, the greatest

needs of the user. For example, real-time indicators in the form of color-coded icons can give e-business executives a quick snapshot of the health of a critical (and profitable) e-business transaction. In-depth statistics and individual component status and workloads are available for technicians.

An RTMS gives you the power to proactively monitor and manage your e-business information flows, assuring that your infrastructure is performing at its optimum.

Lanum, president and CEO of Fortel, can be reached at [asa@lanum.fortel.com](mailto:asa@lanum.fortel.com).

### Ask Dr. Intranet

By Steve Blass

We're running out of IP addresses and must implement Network Address Translation (NAT) on our school district's four-school WAN. Our

Windows NT network uses 3Com's Linkbuilder FMS 2 and Netbuilder Remote Office routers and hubs at each site. We think we know what router and firewall hardware we need at the site linking us to our ISP via a T-1 line, but what do we need at the other sites?

A single NAT gateway on the Internet T-1 can hide your whole network. Renummer the IP addresses on your internal routers to use private IP addresses. Switch your intranet servers to private IP addresses.

Your Internet servers will need to be configured in your NAT gateway. Convert your Dynamic Host Configuration servers' IP address pools to the private IP scheme. The NAT reference page for 3Com's Netbuilder is under the Service & Support/Routers/Netbuilder area at [www.3com.com](http://www.3com.com).

Make sure to re-address one campus at a time. When you renumber a site and turn on NAT at the router that connects them to the rest of your network, they will see them behind the same old IP address on the same old router. That way you don't have to do the whole network at once.

Blass is a network architect at [change@work](mailto:change@work) in Houston. He can be reached at [dr.intranet@changeatwork.com](mailto:dr.intranet@changeatwork.com).





Gearhead . inside the network machine . Mark Gibbs

## PHP: ENDING THE FUN

**W**ell folks, it has been a fun three weeks with PHP. In week one ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2831), we took a 5,000-foot

view of PHP, its history and market. In week two (DocFinder: 2830), we looked at how to include PHP scripts in Web pages. Last week (DocFinder:

2829), we looked at using PHP in scripts.

This week we'll wrap up our look at PHP by examining how to handle forms in PHP, then we must move onto other topics that are whetting our appetites.

Handling a form in PHP is easy. Here's a form to be filled in by a user:

```
<form action="phptest.php"
method="GET">
  Your name <input type="text"
name="unam"><br>
  Your town <input type="text"
name="town"><br>
  <input type="submit" value="Tell
me!">
</form>
```

As forms go it's pretty pathetic, but it will serve our purposes. Here's the script to handle the form:

```
<?php Print "<b>$unam</b> lives in
<i>$town</i><br>"?>
```

All our form variables are automatically moved into variables that can be directly referenced by PHP scripts!

What if you want to choose a number of items in a select field on a form? Here's a slightly more complex form and script to do this. First, the form:

```
<form action="phptest2.php"
method="POST">
  Your meal? <select name="menu">
    <option>Breakfast
    <option>Morning snack
    <option>Lunch
    <option>Tea
    <option>Dinner
    <option>Night snack
  </select>
  <input type="submit" value="Tell
me!">
</form>
```

And here's the PHP script:

```
<?php
print "Your choices were: <br>"
print "<ul>";
foreach ($menu as $choice)
{
  print "<li>$choice<br>";
}
print "</ul>";
?>
```

The "foreach" loop extracts the elements out of the array \$menu and puts them into the \$choice variable.

You can find all the variables used in any form stored in the arrays \$HTTP\_GET\_VARS or \$HTTP\_POST\_VARS. You can find out which method, get or post, was used by the form by evaluating the variable \$REQUEST\_METHOD, which will contain "post" or "get" accordingly.

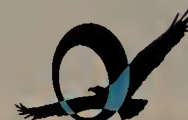
Well, that's it . . . we've given you a taste of the PHP language and its role in the Web biz. For more information check out the following: the home for PHP: [www.php.net](http://www.php.net); PHP documentation: [www.php.net/docs.php](http://www.php.net/docs.php); frequently asked questions about PHP: [www.php.net/FAQ.php](http://www.php.net/FAQ.php); Zend Technologies' (owners of the PHP interpreter): [www.zend.com](http://www.zend.com); resources for Web application development with PHP: [www.phpwizard.net](http://www.phpwizard.net); PHP Builder.Com — terrific PHP resources: [www.phpbuilder.com](http://www.phpbuilder.com); a PHP primer — "Getting Started With PHP3:" [www.phpbuilder.com/getit](http://www.phpbuilder.com/getit).

*So next week it's off to new, uncharted territory. Maps to [gearhead@gibbs.com](mailto:gearhead@gibbs.com).*



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## Editorial

### Don't turn your back on all new, young ventures

**W**ith the failure of so many young telecom ventures it's tempting to turn back to the big old incumbents and leave it at that. But some of these newfangled carriers still seem to have a future. Take Yipes Communications. Only 18 months old, Yipes has regional Gigabit Ethernet fiber networks in 20 cities, a nice service portfolio and some impressive customers. Co-founder and Chief Marketing Officer Ron Young says the company has raised \$280 million (all equity), doesn't have any debt and has more than a year's worth of money in the bank.



Unfortunately for the old guard, it doesn't look like Yipes will dry up and blow away anytime soon.

Why should the telcos be afraid? Because Yipes is using modern data technology to compete with telcos that are trying to use voice-era technology retrofitted for data. Instead of layers of ATM and SONET, Yipes uses Gigabit switches and routers and Ethernet interfaces to connect to the customer. It's simpler, cost effective and ultimately more in keeping with where the world is and where the world is going.

The company's managed services, which include metropolitan- and wide-area offerings, scale from 1M bit/sec to 1G bit/sec in one-megabit increments. Customers can add bandwidth within three hours by calling and having the company tweak the Yipes-owned router on the customer premises. A Web interface in beta testing will let customers add bandwidth on the fly.

Young says that as of last March the average customer was contracting for roughly 5M bit/sec worth of bandwidth, a figure that jumped to 25M bit/sec in August and was a couple orders of magnitude greater than that in December.

Young insists price isn't the main customer motivator, but it is hard to imagine major companies entrusting a newcomer without that incentive. A 3M bit/sec Yipes access link costs \$450 per site, per month, up to one-half the cost of a traditional T-1 pipe.

The company recently added managed firewall and Web hosting services, and will be climbing the food chain as it matures. The plan, Young says, is to interconnect with the public switched telephone network and begin offering voice services sometime this year.

Very ambitious. But this is one upstart that might just be able to pull it off.

—John Dix  
Editor in chief  
jdix@nww.com

Message Queue

### TINKER-FREE ZONE

I have read many articles and letters of response about the strict policies at some firms regarding users installing and downloading software, and tinkering with the network ("Should users be allowed to add whatever they want to the network?" ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2739)). The ones who are complaining are obviously the ones who have been caught. They are also the first to complain when their PCs are not functioning correctly, they can't connect to the network or they can't use one of the network printers.

We don't let employees load any software on their PCs, tinker with any network devices or install devices brought from home. We have an open-door policy should someone have a suggestion. We will research the suggestion; if it's a fit for the organization and is cost-effective, it's a go.

Steve Anagnostis  
Thorofare, N.J.

### COLD STORAGE

Regarding Mark Gibbs' "Backspin" column on unusable storage ("Data over the horizon," ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2740)):

I recently visited the company that stores many of my employer's paper records. I was given the grand tour, including the temperature/humidity-stable areas where media of various kinds were housed.

My guide pointed out what looked like 35mm film reel cans. He explained that these were tape backups from a financial institution which, by federal statute, had been there for many years and would continue to be so. He observed that if anyone needed to examine the tapes, there was no hardware on which to run them. Furthermore, it was unlikely that the tapes — despite the state-of-the-art storage facility — were in any condition to support such an examination even if the hardware were available.

The emotional need to save things is often a silent partner of seemingly rational rules about saving data. What will we do with the information, as well as the media we have collected, as it deteriorates

E-mail letters to [jdix@nww.com](mailto:jdix@nww.com) or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

[www.nwfusion.com](http://www.nwfusion.com)

## MORE ONLINE

Find out what readers are saying about these and other topics.

**DocFinder**  
2821  
find it online

rates like the lamp in our basement that we will fix — some day?

Jon Chorney  
Systems administrator  
Simon, Master & Sidlow  
Wilmington, Del.

### AVERTING DISASTER

As a business continuity planner, you think you have planned for every disruption and have controls to mitigate any issue. After reading the feature "Disaster diary" ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2741), I now will rethink the little things that were assumed. Thanks for the article.

Jules Edwards  
Senior business continuity planner  
Fleet Mortgage  
Columbia, S.C.

### VOTES FOR SALE

In his Jan. 15 letter to the editor, Robert Lee suggested issuing each registered voter a personal ID to ensure that each citizen voting via the Internet gets only one vote. This ID could then be conveniently used wherever polling stations have been established.

Unfortunately, this does not preclude enterprising individuals from selling their personal ID info to the highest bidder to stuff the electronic ballot box. Given that people have tried to sell their internal organs on eBay, don't ignore this possibility. I don't think we want a country where democracy is based on votes bought and sold.

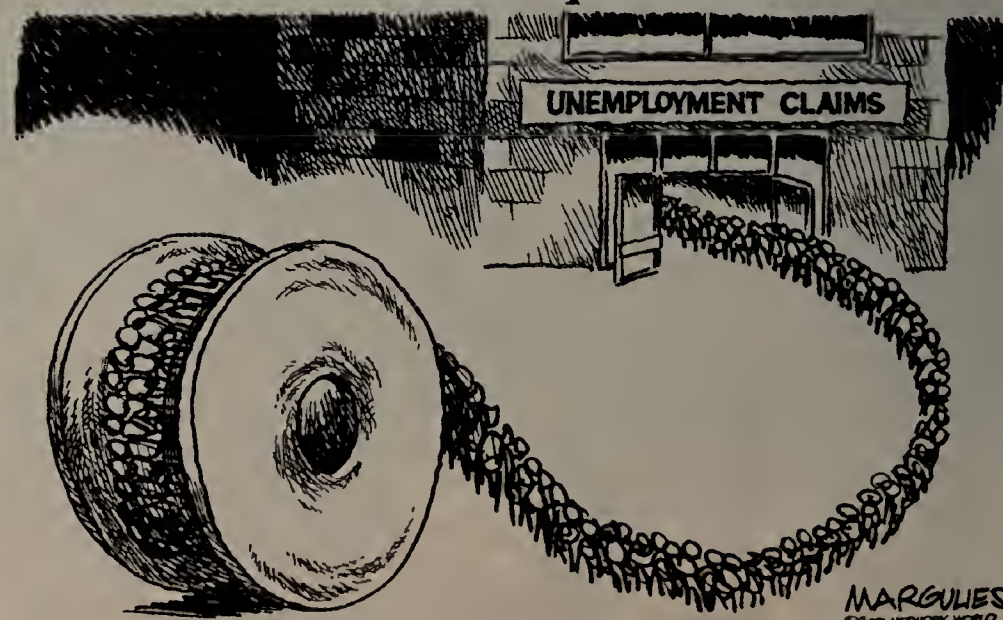
Mike Palombo  
Lawrence, Pa.

### WHO'S THE BOSS?

Regarding David Rohde's column "Avoiding the convergence distraction" ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2742): It's been my observation that things differ greatly depending on which group is the dominant force in an organization: sales and marketing or engineering and manufacturing. All these useless-but-really-neat technologies (such as voice over IP) are what you get when the techies are running the show.

Richard Cottingham  
Oakville, Ontario

### LUCENT Fiber Optic Line





## A LITTLE PLANNING CAN DRIVE AWAY THE 'ROAD WORRIER'

**A**re you a "Road Warrior?" Do you regularly fly to various sites to do battle with computer gremlins and daemons? If so, you may have learned that a clear mind, comfortable clothes, a laptop loaded with your favorite diagnosis tools and a No. 2 Phillips head screwdriver are about all you need. These trips and trade shows may be the extent of your travel experience.

Then you get "the call." Headquarters wants you to explain that new configuration you thought up. Or you need to teach remote employees how to use their new computers. As you set out, armed with unfamiliar tools such as projection units and PowerPoint presentations, you find yourself changing from fully qualified "Road Warrior" to neophyte "Road Worrier."

What does it take to ensure a successful road trip? It takes a little bit of planning, a little bit of preparation and a whole lot of self-awareness. First, get comfortable with your presentation. Think about what points you'll need to make for each slide and remember to add at least one fact that isn't on the screen to each. This keeps the listener alert and involved.

Try to travel the day before your presentation. If you sit on an airplane all morning you're certain to be tired by afternoon.

Once you're there, get a good night's rest. Most airline seats seem to have been designed by the Marquis de Sade, guaranteed to deliver you battered and twisted to the destination. The best way to recover from time spent in the torture chamber is a full night of sleep.

Hardware and software also need to be dealt with prior to departure as well. Make sure the projection unit you're taking is compatible with your computer, working and well packed. Don't check it as luggage. Even though it's large and unwieldy, carry it on because these things are notoriously fragile. Check to see if there's a backup at the destination and let your hosts know that you'd like it to be available, just in case.

Take good care of your computer too. Back it up, and make sure that there are several copies of the pre-



sentation on the hard disk. Better yet, burn the presentation and the software onto a CD-ROM that can be installed onto a back-up computer.

When you do this, make sure the presentation runs from the CD-ROM and has all the graphics, sounds and other parts intact. As a last resort, print your presentation

onto transparencies, and carry it with you. Sometimes a plain old low-tech overhead is all you need to save the day.

All it takes is a little bit of planning, a little bit of awareness, and the ability to accommodate problems and changes. One or two successful trips and you can look back at the old days as a "Road Worrier" and laugh. Oh yes, one more thing: Don't forget the No. 2 Phillips head screwdriver. You can't be a Road Warrior without it.

*Shapiro is district technology coordinator for Kingsport City Schools in Tennessee. He can be reached at [jshapiro@kpt.k12.tn.us](mailto:jshapiro@kpt.k12.tn.us).*

## FCC ADDS TO INSTANT MESSAGING STANDARDS MESS

**T**he interoperability outlook for the instant messaging and presence market keeps growing cloudier. Some of the blame lies with the instant messaging/presence industry itself. Vendors and service providers have spent years developing, proposing and bickering over interoperability specifications that always seem to die in committee.

But federal regulators are also responsible for hindering standards-based, multivendor instant messaging/presence interoperability. Last month, the Federal Communications Commission let AOL keep its instant messaging/presence services closed and proprietary when merging with Time Warner. The FCC said it could not justify imposing third-party interconnection

requirements on AOL's "earned monopoly" in Internet-based instant messaging/presence services.

Paradoxically, the FCC, in the same decision, didn't shy away from requiring AOL Time Warner to interconnect its cable TV systems' broadband networks with third-party Internet service providers.

Adding insult to idiocy, the FCC imposed supremely bogus "restrictions" on AOL Time Warner's instant messaging/presence services. The commission said if AOL Time Warner sought to integrate its current instant messaging/presence service into cable TV-based videoconferencing services, the firm would have to interconnect with others providing similar instant messaging-enabled broadband videoconferencing services.

Opening AOL's instant messaging/presence services would not be such a nightmare. But under an alternative scenario, the FCC could have required AOL Time Warner to publish the proprietary protocols on which AOL Instant Messenger and ICQ are based. The regula-



tors could have required the media monolith to stipulate nondiscriminatory interconnection procedures and interfaces with which third-party instant messaging/presence solution providers would have had to comply. AOL could have been given the latitude to deny interconnection from third parties that failed to block instant messaging-based viruses, spam and porn. If the FCC had placed these conditions on the merger, AOL Time Warner would continue to enjoy a predominant market position in the instant message world.

Instead, the FCC decision leaves the instant messaging/presence market so balkanized among incompatible, vendor-proprietary protocols that we may have to wait years to see a universal instant messaging/presence infrastructure that rivals today's standards-based Internet e-mail environment. Last year, the failure of the IETF's Instant Messaging and Presence Protocol (IMPP) Working Group to publish draft interoperability standards was a major disappointment. Indeed, the IMPP

Working Group is on the verge of dissolution and has not yet merged competing proposals into a unified draft standard.

Instant messaging and presence cannot be enterprise-grade services without open interoperability specifications. For example, at the server-to-server level you won't be able to easily interface premises-based and outsourced instant messaging/presence environments.

The IMPP Working Group's failure kills any hopes the industry had to see standards this year. For some time, most instant messaging vendors and service providers have bowed toward the "eventual" IMPP standards. Even AOL has expressed a general commitment to some day implement whatever standard emerges from the group.

Now it's clear that the wait-for-IMPP approach has proven counterproductive for the industry.

The most likely beneficiary of the IMPP Working Group's failure is the Jabber.org instant messaging/presence open-source initiative. Jabber stands a decent chance of becoming a de facto industry interoperability framework in lieu of IMPP. For now, though, Jabber is just one of many competing interoperability frameworks in a crowded, confusing marketplace.

To develop into a business-grade service, the instant messaging/presence industry will need to break through the standards stalemate this year. It's just not clear who will provide the leadership necessary to pull it from the muck.

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## Is Windows 2000 ready for full rollout?

*Proponents give the package a green light; others cite training issues as reason to proceed with caution.*

**YES**

BY NELSON RUEST

Of course Windows 2000 is ready for full rollout. If you use Windows today, you cannot afford not to use Win 2000.

Win 2000 is not just a remake of Windows NT; it is a completely new system based on NT concepts. Several of Win 2000's new features are specifically oriented toward increased stability and 24-7 operation. Windows' system file protection and Windows Installer service ensure that the operating system is always stable because only the operating system has the right to modify system files. If any other application modifies these files or tries to "break" another application by replacing core

Dynamic Link Libraries, they are automatically repaired. Network load balancing, built-in clustering, COM+ component sharing, direct integration with routers and integrated public-key infrastructures also extend Windows' capabilities.

The core of the Windows network has been completely redesigned to become Active Directory Service, an information repository that forms a virtual space in which people, PCs and processes can interact. Active Directory is the basis for the evolution of the network. With .Net Servers, Microsoft extends Win 2000's basic features to form a complete enterprise information system for messaging, e-commerce, host integration, business-to-business operations, data repositories and more. It all extends from the original

design of your Active Directory. Yes, Microsoft has done its homework.

Don't take my word for it. Even though my company has implemented more than 100,000 stable systems with all versions of Win 2000, we're not the only ones who claim it's ready for prime time. In December, Giga Information Group released a report stating that "organizations will realize a significant return on investment with Win 2000, providing they take the time to do it right."

Doing it right means properly preparing your Win 2000 and Active Directory design. If Active Directory forms the core of your network and the basis for its evolution, you must ensure that its design properly represents your organization. If not, the network and its evolution will be stymied. Another key point is whether you decide to upgrade or reinstall. Upgrades tend to drag along limitations of the NT environment.

Complete reinstalls cost more initially but let you take full advantage of all of Win 2000's features.

It's clear that any organization that uses Windows should be using Win 2000. But don't get me wrong. Moving to Win 2000 is no easy affair. It will take a lot of effort and planning. You'll have to marshal resources from all levels of your company — IT, human resources, communications and more — if you want to do it right. But once it's done, you'll reap the rewards.

*Ruest is director of Resolutions Enterprises, a consultancy in Quebec. He is a Microsoft Certified Systems Engineer and Microsoft Certified Trainer. He can be reached at nruest@reso-net.com.*

**NO**

BY JEFF ALLRED

Taking into account the usual woes encountered with Version 1.0 of Microsoft products, the security issues associated with the lack of interdomain partitioning and the high cost of upgrading hardware to Windows 2000 compatibility levels, the real question we should be asking is: "Is my IT support group ready for a full rollout of Win 2000?" After careful consideration, most groups would answer, "No."

Remember going from Windows 3.1 to 95? The user interface took some getting used to, but for the most part, you upgraded or reinstalled, and lived through the new operating system blues. It was the same story with moving from NT 3.5 to 4.0 — new user interface, some new features and bugs, but generally speaking, the concepts were the same. Win 2000 with Active Directory is a whole new ball game. Kerberos security, Domain Name System, IP Security, Group Policy Objects and Encrypted File System are all new to NT 4.0 administrators. If you don't use Exchange as your corporate e-mail system, you will probably need to learn about X.500 and Lightweight Directory Access Protocol.

Even the brightest among your staff are going to need some serious training to effectively implement Active Directory, and while most of us are lucky enough to have a training budget, it is usually not enough to retrain your entire group at once. Assuming that you have the time and resources to properly plan your Active Directory implementation and, assuming you have the means to get your IT staff properly trained, you must now train your user base. Typically users do not react well to change in their computing environment, and Active Directory is a hefty change. Configuring network places and drive mounting within Active Directory is different than previous Windows versions, and produces a new look and feel, which will confuse many users.

None of these changes are earth-shattering. But changing your architecture and user interface without thoroughly planning your structure or properly training your support staff will result in an unfavorable response from users and management.

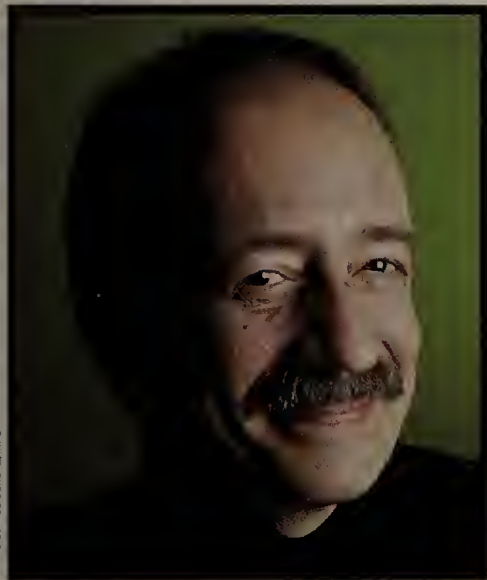
The current industry practice of releasing software before it is truly ready for production is not going to change as long as we, the buyers, keep settling for these products.

While most of us would prefer to stick with a proven, solid product rather than upgrade to an unproven, questionable product, we are usually driven by end-user or top-dog demand in response to market hype.

Yes, there are problems with Active Directory, and yes, Microsoft will address the problems, albeit slowly. The problem is IT departments jumping into Win 2000 without being fully prepared on all fronts — education, planning and hardware.

As a wise opossum once said, "We have met the enemy, and he is us."

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# GO AHEAD, GO

**Enterprise network managers give wireless LANs a stamp of approval.**

BY JIM GEIER

*ENGINEERS AT DOW CORNING in Midland, Mich., were wasting their time in too many meetings where they couldn't access the network for important documents. So network managers installed an Enterasys wireless LAN in the office to support 130 users with radio-equipped laptops. The laptops give workers access to their e-mail, the Internet and project documents. Now employees can work at their desk, in a conference room or in a colleague's office.*

"Staying connected from any location lets the users communicate more effectively and participate in different workgroups throughout the day," says Jim Marshall, Dow Corning's network manager.

In the past, companies installed wireless LANs to support applications such as inventory management in warehous-

es and item price marking in retail stores. Even though wireless network interface cards (NIC) cost \$800, going wireless was worth the investment because of improved efficiency. High prices and relatively low data rates, however, kept corporate network managers from using wireless LANs for general applications.

With the appearance of inexpensive, high-performance 11M bit/sec products based on the IEEE 802.11b standard, acceptance of wireless LANs for enterprise applications is sharply on the rise. If you've got roaming workers, new offices or are looking to install a LAN without putting in new wires, a wireless LAN may be the answer.

#### **Lower cost, higher efficiency**

Like Dow Corning, companies are installing wireless LANs for portable access to the corporate network and providing a better means for collaborating with co-workers.

Some companies are also putting wireless LANs in remote offices, such as a sales office. This gives staffers access to headquarters without having to install an expensive wired network. The wireless LAN is also convenient for visitors from other corporate offices. For example, a manager from headquarters can access printers or e-mail from anywhere within the

office, avoiding the need to find an available Ethernet tap or use someone else's computer to connect to the network.

Because of the lower prices, some companies are beginning to favor wireless over wired Ethernet to avoid costs and schedule delays associated with installing Ethernet cabling. For example, the typical price of a wireless LAN NIC is around \$200 each, with some as low as \$99. While Ethernet NICs (around \$50 per card) are lower in cost, you still have to install an Ethernet tap, wall plate and Category 5 cabling, which can cost \$200 per tap for labor and materials.

Mercedes Benz USA, in Camden, N.J., installed a Lucent wireless LAN within its corporate office headquarters. For Mercedes officials, the cost savings of avoiding rewiring when moving users in its corporate offices made the project cost-effective. "As far as we're concerned, the program has been a great success," says Larry Roll, Mercedes' supervisor of Mercedes' Telecommunications Group.

Wireless LANs can also extend the network connection throughout a metropolitan area. For example, the city of Greensboro, N.C., Inspection Department uses Cisco wireless LAN access points situated at eight locations throughout the

city so inspectors can access the central system at the city headquarters while in the field.

These wireless LAN "islands" connect to the city's central system via optical fiber. Throughout the day, inspectors drive to the nearest island and review itineraries, process inspection information and check e-mail. This application improves efficiency and reduces the time it takes to process inspection reports, as inspectors don't have to drive back and forth to city headquarters.

"The wireless network saves everybody a lot of time. We have calculated that it adds two hours per day per inspector, and we have 32 inspectors. That's like getting eight new people without paying for them," says Walter Simmons, codes enforcement manager for the city.

#### **Some performance issues**

While 11M bit/sec is a vast improvement over previous wireless LAN speeds, network managers say the performance tops out at a level that is comparable to shared 10M bit/sec Ethernet. That's fine for e-mail, Web browsing, file access and interaction with corporate systems, but many companies have moved to 10/100 switched Ethernet for bandwidth-intensive applications.

For example, Jim Marshall, Dow Corning's network manager, says a

NetworkWorld

BUYER'S

Wireless LAN access points

GUIDE

**Review:** We tested how ready nine 802.11b wireless LAN access points are for the enterprise. **Page 50.**

**Net Worker:** Home network gear using the HomeRF standard may not work with your corporate 802.11b wireless network. **Page 54.**

**Wireless NICs:** Some of the same cards perform differently. **Page 56.**

**Online:** Interactive Buyer's Guide chart. **DocFinder: 2832**

**Saving lives with roving LANs.**  
**DocFinder: 2833**



# PUT THE WIRES

wireless LAN falls short when making large FTP transfers. Switched Ethernet does a good job of handling high utilization when transferring large files, but the sharing of the wireless bandwidth can mean some users will be blocked when a large file transfer is occurring.

The newer 22M bit/sec wireless LANs being released early this year, however, should push wireless LAN

throughput to levels comparable to 10M bit/sec switched Ethernet.

## Is interoperability the key?

Of course, the purpose of the 802.11 suite of standards is to provide interoperability, and network managers report success with operating multivendor radio cards on the same wireless LAN. While multivendor wireless LANs work, the network will only provide 802.11 functions. You'll lose the proprietary, non-802.11 performance and supportability enhancements that each vendor has added to its product line.

As a result, it's advisable to install a wireless LAN comprised of components from the same vendor to maximize the effectiveness of your wireless LAN. However, you should think about interoperability issues when you've got users who may utilize a wireless LAN at an airport, hotel or convention center for Internet access.

Also, network managers often find that wireless LANs fall short of expected range. Even

though a vendor's specifications may say that the wireless has a range of 300 feet, obstacles such as walls, desks and filing cabinets can significantly decrease the range in some directions. This results in an irregular propagation pattern of the radio signal. To provide adequate radio coverage throughout work areas, you should hire someone to perform a radio frequency site survey that determines the number and location of access points, as well as uncover potential radio frequency interference.

Network managers also report a common problem dealing with the availability of electrical power when installing wireless LAN access points. For example, Mercedes' Roll encountered problems when running electrical wires to each access point. These installations generally require hiring an electrician to route and splice electrical wires to each access point. However, most of the wireless LAN vendors are beginning to offer methods to supply power to each access point over its Cat 5 cable connection to the Ethernet switch. This form of power delivery will greatly speed installations by

eliminating the need to install electrical wires to the access points.

## Faster data rates are on the way

By the end of 2001, vendors should begin initial shipments of IEEE 802.11a-based wireless LANs, which offer data rates of up to 54M bit/sec. Instead of using 802.11b's direct sequence spread spectrum, the 802.11a standard specifies orthogonal frequency division multiplexing (OFDM) for transmitting data in the 5-GHz frequency band. OFDM not only provides higher data rates, but can also better tolerate transmission distortions resulting from multipath propagation and radio frequency interference.

Another standard, HiperLAN/2, is based on the 5-GHz OFDM modulation. However, the standard is not scheduled for completion until early 2002. It's likely the 802.11-based products will prevail because of earlier product availability and network manager's familiarity with the 802.11 standards. Furthermore, existing frequency allocations will likely limit use of HiperLAN/2 to Europe, with 802.11a the standard in North America.

The existing and near-term 802.11 standards provide a strong basis for effective wireless LAN products, capable of supporting enterprise applications.

*Geier provides independent consulting services to companies implementing wireless networks. He is the author of the book, Wireless LANs, and his Online Guide to wireless networking is located at [www.wireless-nets.com/guide.htm](http://www.wireless-nets.com/guide.htm). He can be reached at [jimgeier@wireless-nets.com](mailto:jimgeier@wireless-nets.com).*



Larry Roll of Mercedes Benz uses a wireless LAN that saves the company the cost of rewiring when users change offices.



# PUTTING

# 802.11b

# TO THE TEST

**W**hile this may be the fourth or fifth straight year you've heard this, it's finally the year of the wireless LAN.

With the acceptance of the 802.11b standard, a number of products and vendors have hit the market with access point products for the enterprise. We tested nine wireless LAN access points: the Buffalo Airstation from Buffalo Technologies; the Aironet 340 from Cisco; the DWL-1000 AP from D-Link; the RoamAbout Access Point 2000 from Enterasys; the Intel Pro/Wireless 2011 Access Point from Intel; the Intermec 2102 Universal Access Point from Intermec; the Orinoco AP-1000 Access Point from Lucent; the Harmony 802.11 Access Point and Access Point Controller from Proxim; and the Spectrum 24 11M bit/sec Access Point from Symbol Technologies. Breezecom accepted our invitation, but could not send us the equipment for our tests in time to be included in the review.

To fit into an enterprise network, performance is essential, but it's not enough by itself. You also want manageability, stability and security. Anyone who has managed large and small LANs knows that what works in a small office, home office (SOHO) environment doesn't always scale well into a company. Several vendors sent us very good SOHO equipment that we would have severe reservations about in a larger environment. Also, some enterprise gear was lacking in performance.

In the end, despite a higher price, the Cisco Aironet 340 series equipment delivered the best mix of performance and manageability and won our World Class Award.

D-Link, while not truly delivering enterprise-class hardware, offers an extremely good price/performance ratio and gets an honorable mention in a SOHO environment. Proxim offers some stunning management tools, but its product's performance was the lowest of any of the enterprise-class access offerings. Enterasys and Lucent offer good tools, good performance, but their range isn't on par with Cisco's. The Intel and all-but-identical Symbol equipment fell a bit short on management tools.

## How fast is it?

We spent a lot of time benchmarking our 802.11b networks, and the findings are interesting. In all the tests we ran (see "How we did it," page 58), four nodes could saturate the network. An access point is comparable to a 10M bit/sec Ethernet segment, so you can use pretty much the same guidelines you use for 10Base-T loading to govern 802.11b loading.

**Cisco's Aironet access point knocks us out in the 802.11b arena, but others aren't far behind.**

BY MIKE AVERY,  
NETWORK WORLD GLOBAL TEST ALLIANCE

We were surprised to find such a wide spread of data transfer rates between the products. Depending on the test, some network interface cards (NIC) were almost twice as fast as others, and some access points were as much as 50% faster than others (see graphic, page 52).

Statistics showed us that 100M bit/sec Ethernet was between 10 and 20 times faster than the 802.11b network components, depending on the wireless vendor and the test we were running. One thing our benchmarks don't show is what happened to the rest of the network while the benchmarks were running. At one point, we ran the usual office automation tasks during the testing on 100M bit/sec Ethernet and the wireless LAN. With the 100M bit/sec Ethernet, the tasks ran at an acceptable speed.

With the 802.11b network, things crawled to a stop while the benchmarks were running. In short, the wired Ethernet had more headroom. Again, that shouldn't be a surprise.

We were disappointed by the performance of Proxim's Harmony. Proxim has taken an interesting approach with Harmony, making its access

points "dumber" and putting the intelligence into the Harmony Access Point Controller. With the intelligence in the controller, you automatically get a single point of

control. This lets you control many more access points (Proxim recommends 10, although it can handle more), and also lets you have access points based on different technologies. The "dumb" access points also are less expensive than those of the other enterprise-class vendors. Several are cheaper, such as the D-Link and Buffalo, but they aren't in the same league.

It was never clear to us why the performance of the Proxim Harmony lagged. The system design means that all Harmony wireless traffic crosses the wired net-

work twice, but Proxim assured us that wasn't usually a bottleneck, and a bit of math suggests that doubling the traffic of an 802.11 link is still less than 20% of the capacity of a 100Base-T network.

## Security options

The 802.11b standard offers several layers of security. At the lowest level is the System ID, also known as the Electronic System ID, SSID or ESSID. This is an identifier code the system manager enters into the setup of all the access points and NICs that will participate in the network. By default for all the vendors except Intel and Symbol, you can enter the word "any" into the NIC setup, and the PC can participate in any network. This makes it easy to get a wireless network running, but offers no security. Even if the "any" option is disabled, it isn't hard for someone to look up the ESSID and use it later — on a laptop in the parking lot, for example. As a management issue, it is difficult to change the ESSIDs of all your access points and NICs quickly. As a result, we don't consider ESSIDs to be a valid security tool. Some of the NICs had drivers that let us enter several ESSIDs into their setups, letting them connect to any number of access points. This offers users greater flexibility in connecting to a wireless LAN in a hotel, conference center or airport. However, this increased flexibility for the user means that the system manager is more constrained from making changes because they will impact infrequent users.

The next layer of security is the access list. The access list contains the media access control (MAC) address of the systems that are authorized to access the network through that access point. With most NICs, you can change MAC addresses at setup, so it is again easy for an employee to write down MAC addresses and then enter one of them into his laptop in the See Review, page 52



The performance of Proxim's Harmony access point lagged.





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Review,  
Continued from page 50

parking lot. A more significant management liability is the access list needs to be entered into each access point that you are managing. Proxim offers a centralized point of management through its Access Point Controller, while Cisco, Enterasys and Lucent offer ways to automate the updating process. But for the rest of the vendors tested, this remains a manual process.

The previous security options authenticate the computer to access the network rather than the user. The last level of access security is the use of Remote Authentication Dial-In User Service (RADIUS). RADIUS has the advantage of authenticating the user rather than the machine. Based on a user identification and a password, RADIUS can be centrally managed. Only D-Link and

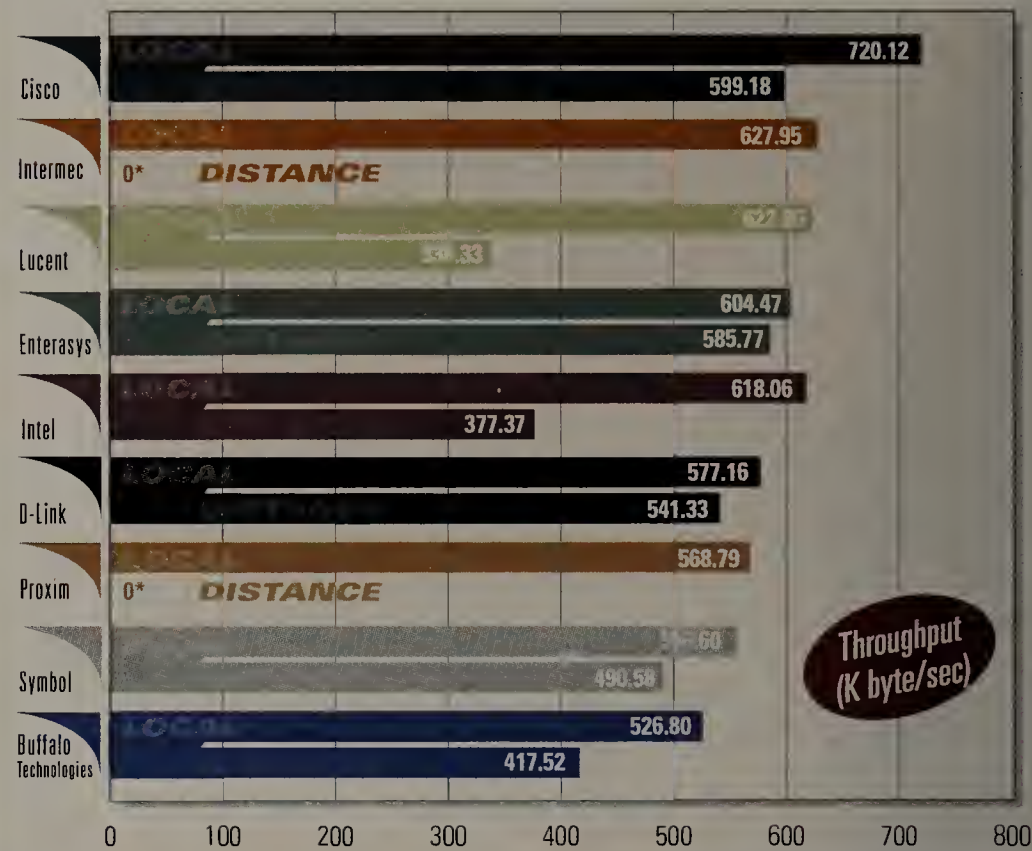
Intermec don't offer RADIUS compatibility. Any password scheme is vulnerable to careless users, but RADIUS gives the administrator a central location to disable user access to the network, which is a major step forward over previous approaches. We strongly prefer a RADIUS-based solution to the other current alternatives.

Once a user has access, the next level of security is encryption. Wire Equivalent Privacy (WEP) can use a 40- or 128-bit encryption key to keep people from being able to use a product such as a WildPacket's AiroPeek to monitor the data. WEP can be disabled. The WEP setting is disabled by default across all the tested products. Disabling WEP makes it easy to set up a network, but also means that protocol monitors can monitor the data on the network. We suggest that you enable WEP as soon as the installation is done. Each machine can have four WEP

See Review, page 54

## Going the distance

Each company's local (10 feet away from access point) and distance (60 feet, between two exterior and two interior walls) throughput (in K byte/sec) speeds:



\* In the distance test, Proxim's and Intermec's access points failed to make a connection to the laptop.

## NetResults

### Aironet 340

**SCORE: 4.9** **COMPANY:** Cisco, (800) 553 6387, [www.aironet.com](http://www.aironet.com). **COST:** \$1,299, \$14,356 for four access points and 40 NICs. **PROS:** Easy to set up, administer and use; great performance. **CON:** A bit on the pricey side.



### Harmony 802.11 Access Point and Access Point Controller

**SCORE: 3.98** **COMPANY:** Proxim, (800) 229 1630, [www.proxim.com](http://www.proxim.com). **COST:** \$2,094, \$11,851 for four access points and 40 NICs. **NOTE:** The price includes an Access Point Controller, which can support up to 10 access points. **PROS:** Excellent management tools and expandability. **CON:** Lackluster performance.

### Intermec 2102 Universal Access Point

**SCORE: 3.73** **COMPANY:** Intermec, (425) 348 2600, [www.intermec.com](http://www.intermec.com). **COST:** \$895, \$15,380 for four access points and 40 NICs. **PRO:** External antenna. **CON:** A solid "C" performer that asks a solid "A" price.

**PRICING NOTES:** In the vendor information above, all prices are list price. The first price is a single access point, including a network card if that is needed. The second price is the price for four access points and 40 NICs, which we feel is a good starting point for office automation. This price will include the needed options, such as an Access Point Controller for Proxim.

### RoamAbout Access Point 2000

**SCORE: 4.55** **COMPANY:** Enterasys, (978) 684 1000, [www.enterasys.com](http://www.enterasys.com). **COST:** \$999, \$13,956 for four access points and 40 NICs. **PROS:** Good setup software, management tools. **CON:** Use of PC Card NIC in AP may mandate use of an extra cost external antenna.

### Spectrum 24 11M bit/sec Access Point

**SCORE: 3.95** **COMPANY:** Symbol Technologies, (800) 722 6234, [www.symbol.com](http://www.symbol.com). **COST:** \$999, \$11,956 for four access points and 40 NICs. **PROS:** Removable external antennas give reasonable performance, and allow easy upgrade to more powerful antennas if needed. **CON:** Management tools could be stronger.

### DWL-1000 AP

**SCORE: 4.25** **COMPANY:** D Link, (949) 788 0805, [www.dlink.com](http://www.dlink.com). **COST:** \$299, \$5,884 for four access points and 40 NICs. **PROS:** Excellent price and performance. **CON:** Not really an enterprise product.

### Intel Pro/Wireless 2011 Access Point

**SCORE: 3.95** **COMPANY:** Intel, (408) 765 8080, [www.intel.com](http://www.intel.com). **COST:** \$999, \$11,956 for four access points and 40 NICs. **PROS:** Removable external antennas give reasonable performance and allow easy upgrade to more powerful antennas if needed. **CON:** Management tools could be stronger.

### Orinoco AP-1000 Access Point

**SCORE: 4.15** **COMPANY:** Lucent, (800) 674 6626, [www.lucent.com/wireless](http://www.lucent.com/wireless). **COST:** \$1,194, \$12,736 for four access points and 40 NICs. **PRO:** Can support multiple wireless LANs with a single AP. **CON:** Use of PC Card NIC in AP may mandate use of extra cost external antenna.

### Buffalo Airstation

**SCORE: 3.78** **COMPANY:** Buffalo Technologies, (800) 688 7466, [www.techworks.com](http://www.techworks.com). **COST:** \$279, \$7,076 for four access points and 40 NICs. **PRO:** Very attractive pricing. **CONS:** Weak manuals, lackluster performance, internal antenna.

## Scorecard

	Security 25%	Stability 20%	Throughput 20%	Management 15%	Installation 10%	Price 10%	Total Score
Cisco	5	5	5	5	5	4	4.9
Enterasys	5	5	4	4	5	4	4.55
D-Link	3.5	5	5	2.5	5	5	4.25
Lucent	4	5	4	3	5	4	4.15
Proxim	4.5	4.5	2	4	4.5	5	3.98
Symbol	4	5	3	3	5	4	3.95
Intel	4	5	3	3	5	4	3.95
Buffalo	4	5	2	3.5	3.5	5	3.78
Intermec	3.5	5	3	3	5	3	3.73

**Scoring key:** 5: Exceptional showing in this category. Defines the standard of excellence. 4: Very good showing. Although there may be room for improvement, this product was much better than average. 3: Average showing in this category. Product was neither especially good nor exceptionally bad. 2: Below average. Lacked some features or lower performance than other products, or than was expected. 1: Considerably sub par, or lacking features being reviewed.



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will be voted **most likely to succeed.**



Jencia Lee, 20

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keys entered into it, and the system manager can decide which key to use, and can use a separate key for transmission and reception. However, managing WEP keys can be a significant maintenance and management issue.

### Can you manage?

Management issues can make or break your security, and overall the management tools of the products we tested are not where they should be.

Each product offered several ways to control the access point. These ranged from serial cables — useful if the access point won't respond to other means of persuasion — to telnet, Web interfaces, FTP, SNMP and proprietary management consoles. The vendors that offered proprietary management consoles usually didn't offer a

Web console. Enterasys told us that a Web interface couldn't have the richness of its proprietary console. Looking at the Cisco, Intel and Symbol

Web-based consoles showed that a Web-based console could be very rich indeed.

We preferred using a Web interface because it meant we didn't have to install another set of vendor-specific software on our machines. System managers seem to reinstall more often than

Intermec's access point was a solid "C" performer with an "A" price.

most, so a Web interface means we don't have to keep track of the vendor's CDs and reinstall the proprietary client again.

Some of the units we reviewed don't support a RADIUS server, and as a result, they have to use ESSIDs or access lists to control access. As mentioned, ESSIDs aren't all that secure. Access lists are a step up, but there are some management issues. An access list is a table of the MAC addresses of NICs that are allowed to connect to the network. The list takes up memory in the access point, so there is a limit

### By the numbers

Some of the numbers and terms involved with 802.11b:

**CARRIER FREQUENCY:** 2.4 GHz is analogous to the frequency of an FM radio station. This frequency range is heavily used, with microwave ovens and cordless phones fighting for their share of the range.

**SIGNALING SPEED:** 11M bit/sec. This is the greatest rate at which data can be sent. 802.11b is interesting in that it can reduce the signaling speed to increase its range or punch through interference. It can run at 5.5M bit/sec, 2M bit/sec and 1M bit/sec.

**DATA TRANSFER RATE:** This is similar to the take-home pay portion of your paycheck — it's what you get to use. We tested to measure the actual data transfer speed under a number of circumstances.

**CHANNEL NUMBER:** The 802.11b specification sets up 14 channels, which can each deliver an 11M bit/sec data link. In the U.S., the FCC lets us use 11 of these channels. France has four channels, while the rest of Europe has 13, and Japan has one. The dirty little secret is that each channel somewhat overlaps the frequency range of the adjacent channels. As a result, if you want to use Channels 1 and 2, your performance will suffer. In the U.S., Channels 1, 6 and 11 are far enough apart that they do not overlap.

of how many nodes an access point can support. By default, Cisco supports 2,048 nodes, but that number can be increased to as many as 64,000, although the unit could run out of

memory if this is done. Lucent comes in second with 497. After that, the numbers drop off quickly.

Among the vendors we tested, only See Review, page 56

## PUTTING YOUR WIRELESS HOUSE IN ORDER

BY TONI KISTNER

It's an ideal scenario. In the office, you roam the floors with your notebook, always connected to the corporate LAN via an 802.11b wireless connection. At the end of the day, you head home, and connect the same notebook to your wireless home network to share your broadband connection.

If only it were that simple. Today, on the corporate side, your only choice is 802.11b. But when your workers head home, they're confronted with home network products — PC cards, Universal Serial Bus devices and residential gateways — that may use a competing standard, HomeRF.

HomeRF was built from the ground up as a home network technology. It operates in the 2.4-GHz band and uses frequency hopping spread spectrum radio frequency technology. HomeRF member companies include Intel, Motorola, Siemens, Compaq and Pro-

xim. In contrast, 802.11 was built from the ground up for corporations. It too operates at 2.4 GHz, but uses direct sequence technology. Wireless Ethernet Compatibility Alliance (802.11b) supporters include 3Com, Apple, Dell, Cisco and AMD.

Each method has strengths and weaknesses in terms of range and resistance to interference from other devices in the 2.4-GHz band, such as cordless phones and microwave ovens, as well as with Bluetooth. However, 802.11b is much faster and supports roaming, making it better

equipped for the company.

While 802.11b made inroads into the home via Apple's iBook and Airport combination, according to recent numbers from PC Data (cited by HomeRF's Wayne Caswell), of all home network technologies that don't require additional wiring (which includes HomePNA, AC power and wireless), HomeRF products account for 45%.

Some things to keep in mind: While HomeRF was never meant to work in an enterprise environment, Version 2, promised for release this summer, will allow for 10M bit/sec and supports roaming — muddying the waters

even further. However, historically, HomeRF has been slow to translate technology promises into shipping

products.

Also, keep an eye on 802.11b home network products from Netgear and

Panasonic, built using Sharewave's Whitecap technology. While optimized for multimedia, Whitecap's current version doesn't interoperate with existing 802.11b devices, although the next version, due out this summer, should.

While many residential gateway manufacturers are building support for 802.11b and HomeRF in their boxes, it's still a smart idea to talk to your workers about what they're buying for their home, how it will or won't work with the office wireless LAN

and why. To read about the specific technical issues, head to [www.home-rf.com](http://www.home-rf.com) and [www.wirelessethernet.org](http://www.wirelessethernet.org).

NetWorker

Kistner is the managing editor of Network World's NetWorker section. You can contact her at [tkistner@nwu.com](mailto:tkistner@nwu.com). Visit our NetWorker section, which focuses on teleworking network issues, at [www.nwfusion.com/networker/](http://www.nwfusion.com/networker/).

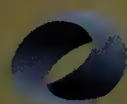




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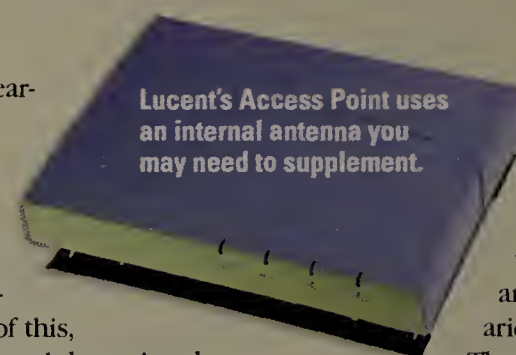
Cisco has access lists large enough to comfortably support an enterprise-sized network. Most vendors' access lists are too small, with most vendors claiming 256 to 512 entries for an enterprise network that is supposed to support global roaming, so RADIUS support is essential for a company.

Encryption prevents others from grabbing data, but the management

issue in WEP is distributing and managing the WEP keys. While the keys are quite difficult to guess or crack, it is easy to write them down and enter them into the laptop. Cisco and Enterasys offer tools to distribute and manage WEP keys, so that they can be changed fairly easily. However, these are extensions of the 802.11b standard, which means you will need to use their NICs as well as their access points to take advantage of these management tools.

As mentioned earlier, Proxim approaches management with its Access Point Controller. We liked the management aspects of this, but we are concerned that using the controller introduces yet another point of failure into a network.

#### Hardware considerations



Where you want to put your access point is governed by radio propagation, user locations and property boundaries of your company. Then there is the cost, as the price of running a

power line can range from high to absurd, depending on where you want  
See Review, page 58

# LET'S TALK ABOUT NICS

Looking at wireless network interface cards (NIC) from nine vendors was an eye opener. There are five basic take-home messages:

NONE OF THEM ARE AWFUL, but they all could be better.

IF YOU HAVE a desktop machine, you need an external antenna.

PROCESSING POWER in the PC counts for a lot.

IF YOU ARE STILL RUNNING Windows 95 that isn't OS Release 2 or later, it's time to upgrade.

THERE ARE ONLY THREE companies that actually make these cards — everyone else is just putting their name on someone else's card.

The basic fact in wireless networking is that people usually don't want external antennas. A quarter-wave antenna for a 2.4-GHz card is about 1.25 inches long and a full-wave antenna is about 5 inches long, so it's not a matter of size, just preference. In using laptops with NICs with internal antennas, we found that small movements of the laptop caused large differences in signal strength. With desktops, we often found the path from the antenna to the access point led through the desktop machine, and performance was greatly impaired as a result. The vendors tell you that an external antenna will typically give about 15% more signal strength. Of greater importance is the ability to place the antenna to avoid obstacles.

In our first test of the Proxim NIC, we used a rather long in the tooth Compaq LTE laptop with a Pentium 166-MHz processor. The performance was so embarrassing we called the vendor to see if we'd done something wrong. Because we had been able to saturate a 10M bit/sec Ethernet with a single 100-MHz 486 processor, the processor shouldn't be an issue. We reran the NIC tests with a Toshiba Satellite with a 600-MHz Pentium III, and the results were much better. In looking at the Microsoft System Monitor, we found that any time we accessed the network — using any vendor's NIC — the processor utilization became quite high.

Buffalo, Enterasys, Intermec and Lucent use the same 802.11 cards. They come from the same factory and have the same Federal Communications Commission ID. However, neither the prices nor the performance of these products are the same. In some cases, the products are packaged differently and have different firmware, so the lineage of the card is not as obvious. In others the vendor straightforwardly tells you that they will sell in an OEM capacity the cards from Lucent.

The difference in performance among these cards is in the drivers and their setups. The cards offer the usual internal antenna with antenna diversity selection. The cards also have a plug that can be removed to

plug in an external antenna to improve range. These vendors offer PCI and ISA to PC Card adapters to let you use their NICs in desktop machines.

Buffalo uses a Ricoh-based card and warns in its manual that the adapter card can only be used with their PC Card NIC. We found that to be true — it wouldn't even recognize its stablemates. The Lucent PCI adapter will only work in an all-PCI system, so if your system has ISA and PCI slots, you can't use their PCI adapter, but must purchase the ISA card. Lucent says this will be fixed in a future revision of its PCI card. Intermec resells the Lucent adapter cards and has all the same problems that Lucent has. Enterasys uses a different vendor for its PCI to PC Card adapter, and their card worked very well. We don't think there is a real performance difference between the ISA and PCI cards when the bottleneck is the 11M bit/sec 802.11 topology, but we would rather not spend more money on ISA devices.

Cisco entered the wireless market through its recent purchase of Aironet. The 340 series PC Card installed easily, delivered good performance with every access point we used and offered very good diagnostic software. The 340 series PCI card features a permanently mounted 340 PC card and an external antenna. While the single external antenna causes the 340 to not be able to use antenna diversity, the results were excellent. Users willing to spend a few minutes with the card can add a second antenna — the connections are open, and the cabling is simple. In the end, we liked the diagnostic software so well we settled on the Cisco card to

perform signal strength tests that we didn't wind up using in this review.

D-Link is the new kid on the block and it's targeting the small office/home office markets. The D-Link products have a PC card called the DWL-650. It's an attractive card that worked with all the systems we tried it on. It offered slightly better than average performance and was reasonably priced. However, it does not support an external antenna, which is a potential performance issue for desktop use. Unlike the Buffalo PCI adapter, the D-Link DWL-500 PCI card is a general adapter that should work with most PC cards. However, the installation is made somewhat awkward by poor layout — the card ejector button on the adapter makes it hard to put the card into a PC.

Intel and Symbol are in a marketing agreement for their 802.11b products (both NICs and access points), so the only differences between the products would seem to be in the name on the box and splash screens. Despite this, there are some performance differences between the cards in our testing.

Still, both performed well, and both installed easily in our systems. While the cards didn't excite us, they offer good performance for the money and were very easy to use in every system we put them in.

A final caveat is if you aren't using a Windows operating system, you need to pay special attention to the drivers that are available for the NICs. Few support FreeBSD, Linux or Macintosh. Windows CE support is still not quite here yet. If you don't check into drivers first, you could wind up with rather expensive paperweights.





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to put the access point. Most vendors, including Cisco, Enterasys, Proxim, Intel, and Symbol, offer ways to route power to the access point through an Ethernet cable connecting it to the network, which lets you avoid installing a power outlet near the access point. However, this approach is not yet standardized, and if you are careless a misconnection can fry a port in one of your hubs or switches.

As with the NICs (see story, page 56), antennas are also a crucial component of your access point. The units from Buffalo, Enterasys and Lucent had no external antennas, which averaged 813K bit/sec on all our performance tests, performing worse overall than the units that had external antennas, from Cisco, D-Link, Intel, Intermec, Proxim and Symbol, which averaged 843K bit/sec on all our performance tests. Several vendors say an external antenna increases the signal by about 15%. However, of greater importance is that you can position the external antenna so the signal can avoid obvi-

ous obstacles. Because an external antenna increases your range, the number of access points you'll need to buy to cover your area is reduced.

Most of the access points are sealed devices. Others, such as Lucent's and Enterasys', use the same NICs to communicate as are used by PCs. This has an obvious effect on the antenna — these products have internal antennas, although you can purchase an external antenna for them too. On the other hand, using PC Card NICs let the customer save a bit of money by buying less-expensive NICs if they don't need 128-bit WEP keys.

This also suggests that you could upgrade the access point to higher-speed technologies without replacing the entire access point. Whether those access points can handle the proposed 22M bit/sec (802.11b extensions) and 54M bit/sec (802.11a) topologies remains to be seen.

The Lucent Access Point-1000 can hold two NICs, which lets you put two channels into an area to increase data-handling capability without the cost of another access point and its installation — just another NIC and antenna.

## How we did it

It's hard to look at a wireless LAN access point by itself. It's a part of a network, and as part of an enterprisewide network it extends communications beyond the LAN. We were concerned with performance, security, manageability, interoperability, stability and scalability.

For performance testing, we connected each access point to our 100Base-T network and configured it using the vendor's default setup. Then, wherever possible, we installed the same vendor's wireless NICs in our eight test machines. Because several vendors did not send us eight NICs, we substituted Orinoco NICs for the missing NICs. In all cases, we could test with at least four of the vendors' NICs.

We ran throughput tests on one, two, four and eight machines simultaneously. To test IPX performance, we used Novell's venerable Perform3 diagnostic, a part of its LANtest suite. To test IP performance, we used scripted FTP transfers using RhinoSoft's FTP Voyager to connect to a local FreeBSD Unix host. In all cases, there were no appreciable differences between the four- and eight-node tests, which tells us that three or four nodes can saturate an 802.11b channel.

Next we checked range. We put a Symbol NIC with an external antenna into a PC in the next building and checked throughput to that machine with each access point. There were about 60 feet, and four walls, separating the access point and the PC.

For interoperability testing, we used an IBM ThinkPad T20 and installed a different NIC in each PC. Then we swapped the access points and made sure all the NICs could connect to each access point. We ran an abbreviated performance test and tabulated the results. This also gave us a good idea of how much performance came from the NICs and how much from the access points.

We also evaluated ease of use, setup, security and stability of the products. In several cases, we found that products we were evaluating were made by the same manufacturer, but the differences in drivers made big differences in the results we observed. We evaluated security by looking at options available to help the system manager secure the LAN, and what the implications of these tools were on manageability. We gave the products points for each of the security features they had — ESSID, Access Lists, RADIUS support, single-point management, 40-bit WEP, 128-bit WEP and central WEP key management.

We gave points to the management category for features including remote power, single point management of nodes, centralized WEP key management, and each way of accessing an access point to control and manage it including serial cable, telnet, proprietary consoles, Web interfaces and FTP.

## Interop, can it happen?

On the point of interoperability, vendors try to tie you to using their access points and NICs. The Lucent NIC client software will show you the signal strength of the access point you are using, but if that access point isn't a Lucent device, you'll get a warning that you aren't connected to an access point. Most vendors offer some degree of reduced capability if you insist on mixing and matching different brands of access points and NICs. In most cases, the issues are largely cosmetic, but they will result in increased calls to the help desk.

However, until the next generation of products are released, the system manager has a difficult decision: Use a single-vendor system, with all the NICs and access points coming from that vendor, or forgo the more advanced management tools.

In a closed network, such as a corporate network, the answer is to go with a single vendor. In a more open environment, such as a college or university network, you may not have that luxury. You can suggest what the students and staff should purchase, but when it comes down to it, you'll likely have to support whatever the users bought.

The Proxim product delivered the only compatibility problem we encountered. None of the machines that we used could access a NetWare file server through Novell's RConsole, regardless of which NIC the node was using. This is a significant issue for a NetWare system manager, but it won't really matter to most users. At press time, we were still discussing performance and compatibility issues with Proxim, which let us unravel the performance issues (see story, page 56) that were caused by a slow PC.

We rated the products tested on installation and documentation. For the most part, all products were easy to install and use, and the manuals were adequate to their purpose. The one exception was the Buffalo manual and software — its manual and on-screen instructions were often confusing.

## Let's get wireless?

At the end of the test, we wouldn't suggest that 802.11b be used to replace an existing wired network, unless there's an overriding need to do so. The 802.11b standard has its places, and in those places it works well. Wireless is great for employees with laptops who move around the company, as it lets them stay in touch. It is marvelous for installations that have to be set up and taken down quickly, such as student registration automation systems in col-

leges and universities or at a trade show seminar. The cost of installing a wireless network is often much less than wiring existing buildings.

Once the next developments in wireless technology appear — 22M bit/sec at 2.4 GHz, and 54M bit/sec at 5.7 GHz — we will be more enthusiastic about running more bandwidth-intensive applications.

At the end of the day, the Cisco Aironet 340 Access Point earned our World Class Award for its strong fit in the enterprise.

It delivers consistently higher performance than the other products, has good manageability, and the price is not totally out of line. For a SOHO environment, we'd lean heavily toward the D-Link DWL-1000 Access Point because it offers good performance and a gang-busters price.

Avery is the founder of Gunnison Territory Network Consultants, a small firm specializing in network design, management and administration. He can be reached at [mavery@mail.otherwhen.com](mailto:mavery@mail.otherwhen.com).

Online

Head to Network World Fusion for a complete features chart from the 802.11b access point vendors, including information from:

- Cisco
- D-Link
- Enterasys
- Intel
- Intermec
- Lucent
- Proxim
- SMC
- Symbol Technologies
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# Management Strategies

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## IT evangelism

**Talking up technology with others in your corporate industry pays dividends.**

BY JOANNE CUMMINGS

**T**he cons seem to quickly outweigh the pros when it comes to promoting technology within your industry. Why help a competitor reap gains from technology insights you've fought hard to master on your own? What do you get in return?

Actually, the benefits of such evangelism can be quick, tangible and, most important, economical, according to IT executives.

It's well worth the time it takes to promote technology within your industry, says Mark Sanders, president of the Wall Street Technology Association, a New York organization focused on the IT needs of the financial industry. "You should want people, even your competitors, to adopt the same technologies you're using. When it comes to technology, the more people using it, the less expensive it gets, and the richer it gets in features and functions."

This is especially true for organizations on the leading edge. Although they may feel they have little to gain from sharing their experiences and getting others up to speed on new technologies, the opposite is true.

"You want other people to learn and understand it because adoption takes time," Sanders says. After all, if a technology takes too long to mature, it will be harder for you to make the most of it.

Because those within your industry are more likely to understand the benefits you're reaping, Sanders says they're the people you need to approach.

Thanks to the Internet, it's easy to compare notes with your peers. "If you want to discuss IT strategy with someone in your industry, most people are just a mouse click away," says David Ballard, executive director for the Office of Infrastructure Services at the Commonwealth of Kentucky in Frankfurt, Ky., and president of the National Association of State Telecommunications Directors (NASTD). The NASTD Web site at [www.nastd.org](http://www.nastd.org) fosters information sharing among government IT staffers via online discussion groups and white papers.

The more time you talk technology with others in your industry, the more time you save on future decisions and deployments.

Talking to his counterparts in public transit organiza-

tions around the country gives Paul Skoutelas the inside track on the drawbacks of deploying IT. "Technology can be expensive, and you don't always see the payoff immediately," says Skoutelas, CEO of the Port Authority of Allegheny County in Pittsburgh, Pa. "But by sharing information with others in our industry, we can think through all those business aspects in advance of making any major decision for a capital investment. That's proven to be especially helpful to us here."

So helpful, in fact, that Skoutelas and others in the transit industry organized their first-ever industry conclave focused solely on IT issues. The conference, TransITech, was held last week in San Diego.

"The transit industry has been slow to adopt new technology, primarily because we operate in the public sector, and financing is an issue," Skoutelas says. "But the more we read about other industries and the gains they're making in technology, the more we see it as a need for us. We're charged with doing a better job of

servicing our customers, and if we can do that at a lower cost and in a more efficient way, that's what's important."

Procurement is one IT area in which the transit industry lags behind. "Our industry probably spends 70% or 80% more than others on procurement simply because we haven't automated enough or invested enough in technology to make us more efficient," says Maureen Bertocci, CTO at the Port Authority of Allegheny County. "If we can show others in the industry some of the real economic benefits to technology, that will make a big impact for them, and us."

Another bonus to promoting technology is that when others decide to adopt products or services you espouse, you can band together to wield clout with vendors or regulators. "Getting together in an organization like the NASTD gives all of us a unified voice that speaks louder than any of us on our own," Ballard says.

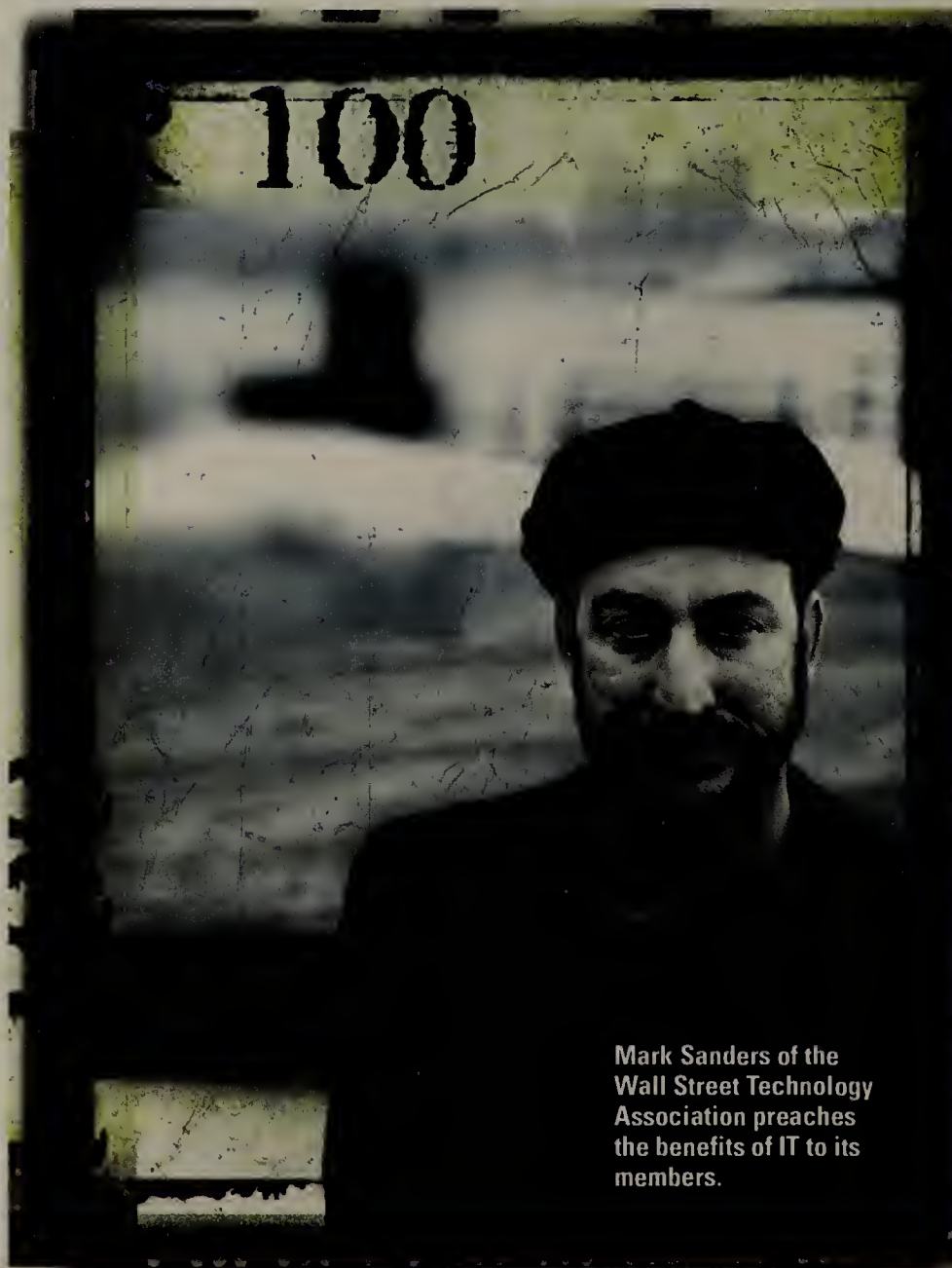
The NASTD recently petitioned the Federal Communications Commission about the Universal Service Fund because state networks support schools and libraries. "There was the perception that schools and libraries were going to have to go out and find new Internet services," Ballard says. "We were able to show that we provide those services already."

This meant that states could receive discounts on services purchased on behalf of agencies covered by the fund.

But what if there is no formal organization designed solely for IT professionals in your specific industry? "You can always find a peer group and make the time to

discuss the impact of technology," Ballard says. "Simply asking prospective vendors for references can quickly put you in touch with people in your industry who are using the same technologies to solve similar problems."

*Cummings is a freelance writer in North Andover, Mass. She can be reached at [jocummings@mediaone.net](mailto:jocummings@mediaone.net).*



Mark Sanders of the Wall Street Technology Association preaches the benefits of IT to its members.

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### TALKING TECHIE

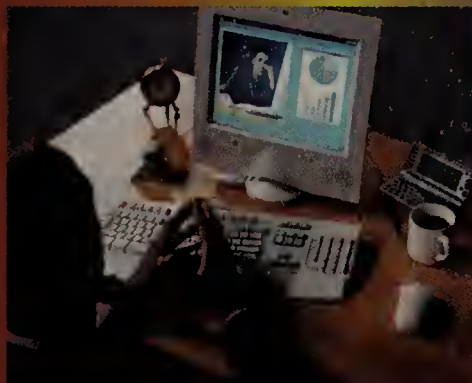
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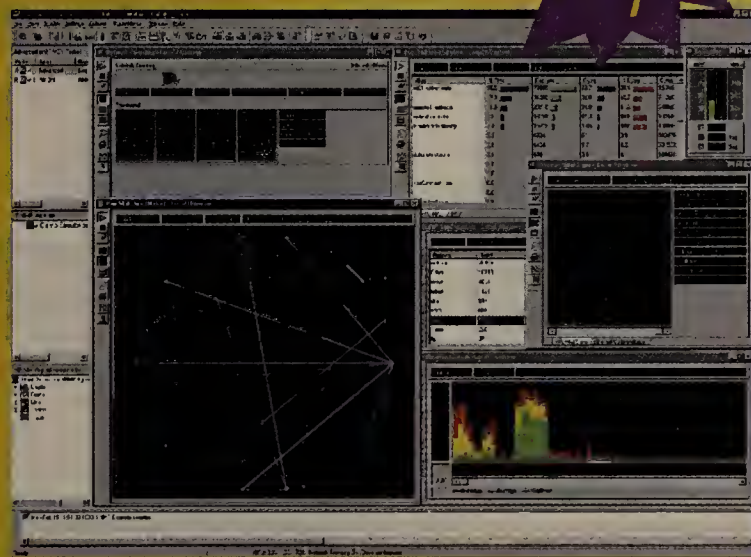


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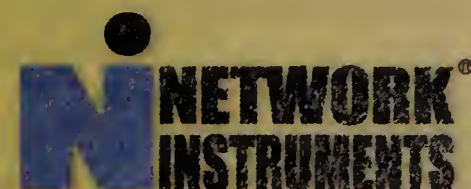
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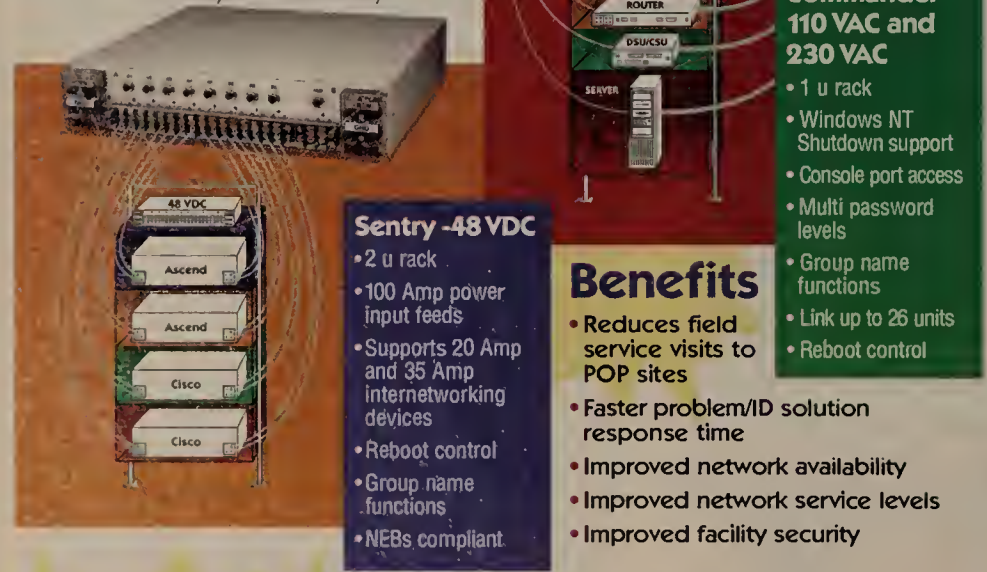


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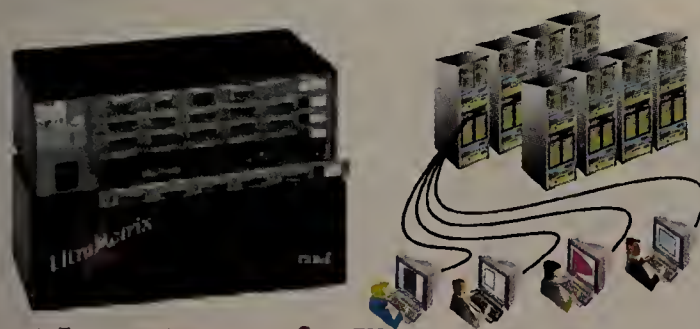
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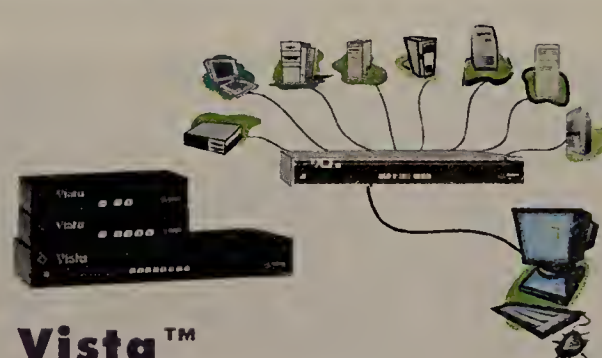
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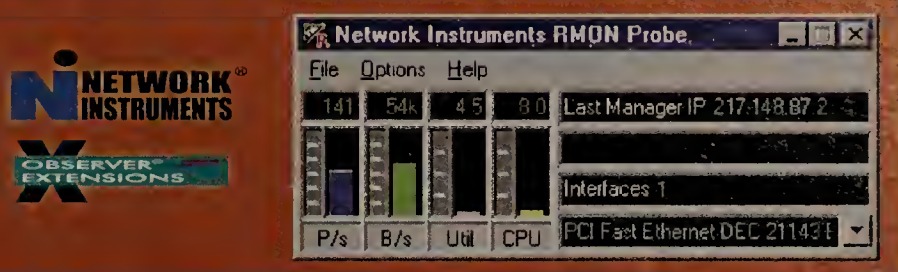
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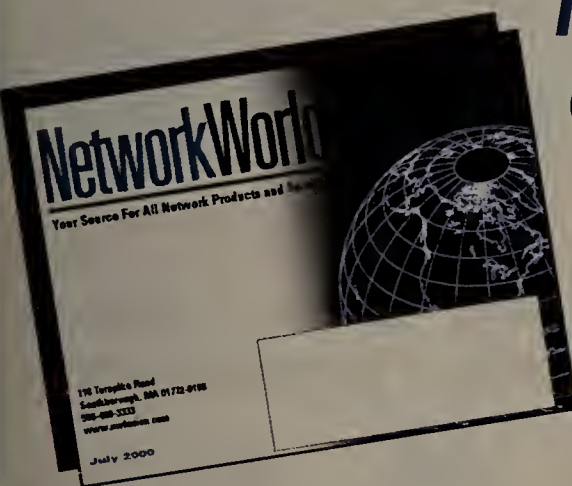
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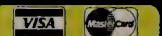
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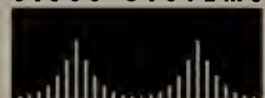
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**Sr. Software Developer** (Littleton, MA) -Research, design, develop, implement and test computer software in a client/server environment, utilizing OOA, OOD and Forte Tool. Translate application requirements and use cases into problem-domain object oriented work products; identify objects. Develop analysis work products, including scenario/sequence diagrams. Translate, transform and implement design work products into source code. Provide technical support to junior team members as required. Must have Bachelor's Degree in Computer Science, Engineering or Related Field or equivalent; and 5 yrs experience in a job offered or 5 yrs progressive experience as a Software Developer. Experience may have been obtained concurrently and must include 5 yrs experience using OOA and OOD in client/server environment and 1 yr experience using Forte Tools. Must have legal authority to work in the U.S. Send resume to Attn: N. Page, SI Corporation, REF: SDV-MA, 3390 Peachtree Road, Ste 1700, Atlanta, GA 30326

**Software Engineer:** Analyze user reqmts & dsqn systms as per user specs on Digital Alpha & Pentium h/ware platforms in Digital Unix, Win NT/95 O/S envrmt. Dvlp systm applics utilizing Sybase as backend & APT as front-end. Utilize T-SOL to write queries, stored procedures, triggers, tables, indexes, rules & defaults. Write data conversion scripts & stored procedures to transfer old systm's data from legacy systms to new systms on Sybase. Write data transfer Scripts for distant located depts utilizing combination of UNIX Shell Scripts & stored procedures. Utilize SOR, Db-Library/C to generate reports. Write systm code in C & C++. Write user manuals documenting systm & train end users. Write DBA scripts to create d/base, take d/base backups, DBCC scripts. Fine-tune stored procedures & create logins. Req: Masters in Comp Sci or Comp Engg or Business or equiv + 2yrs exp in job offd. \$70K/yr, 9a-5p, 40hr/wk. Submit resume or C.V. to Philadelphia Job Bank, 444 N. 3rd St - 3rd Fl, Philadelphia, PA 19123 indicating JO# 9112011.

**Technical Support Specialist** for property/casualty insurance services Co. in Riverview, FL to provide technical computer systm support for info data processing systms & server support for LAN/WAN. Dvlp work goals & coord work on converting h/ware and/or s/ware w/in time & cost constraints. Review, modify, test & correct computer prgms for compatibility & to assure programs meet objectives. Evaluate computer systm for work load & capacity & make recommendations for improvements. Ensure quality & functionality of systm. Lead support team in troubleshooting & problem resolution. Technologies used incl Lotus Notes & Lotus SmartSuite, SOL, Win NT & Win 95/98 w/ TCP/IP protocol. Bach deg in Comp Sci/Engg/Math or equiv & 2yrs in-job exp or 2 yrs related-job exp that includes technical PC & server support system troubleshooting & problem resolution for Lotus Notes, SOL & Win NT. 40hr/wk. M-F, 9am-6pm. \$61,277/yr. Send resume to Workforce Program Support/ A.L.C. Unit, PO Box 10869, Tallahassee, FL 32302-0869.

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Applications can be sent to North America F & A Manager, Digital Equipment (India) Ltd., 334 South Street, SHR 3-2/C6, Shrewsbury, Massachusetts 01545.

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**Senior Vice President, Emerging Technologies, Catharon Productions, Inc.** - Primary responsibility for the creation, delivery and management of revolutionary software systems, created in a newly developed computer language, and for the hands-on management and daily direction of all related resources. Responsible for the creation, delivery and management of credit/charge card authorization, acceptance, payment advice and reconciliation systems. Acts as the first and primary point-of-contact on Catharon's technologies and products. Implements and enforces essential "best practice" systems and processes to achieve successful multi-project management. Develops a systems development project life cycle template. Functions as an active member of the Executive Team in managing overall business strategy and company direction, with an emphasis on technologies, products, software development and credit/charge card payment systems expertise. For company details visit our website at [www.Catharon.com](http://www.Catharon.com). Master's Degree in Information Sciences or equivalent and 2 years of experience required. Respond via email to [Human-Resources@Catharon.com](mailto:Human-Resources@Catharon.com) or fax 518-392-6444 Attn: Human Resources

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**SOFTWARE ENGINEERS** (8 positions): require Bachelor's in Engineering/Computer Science/Mathematics/Science or closely related field with experience providing skills in described duties, at \$60,000 per year; Senior Software Engineers (8 positions) with Master's and two years experience, at \$65,000 per year. Provide on-site consulting in design, analysis and development of software applications for legacy systems in IBM mainframe environment; development and administration in Oracle, DB2, SOL, Server and Sybase; e-commerce and web applications development in Microsoft, Java and related technologies; network management systems development with a Netscape Server and related tools; SAP R/3 applications on Windows with DOS and ABAP/4 and related modules. 40% travel to client sites in the United States. Mail resumes to: YASH Technologies, Inc., Human Resources, 605 17th Avenue, Suite 1, East Moline, IL 61244.

System Software Developer of new tools/technologies & components of MaxxServer system. (e.g.: campaign management, ad serving, statistics collection, e-mail management, system administration, etc.) Develop database schemes to support storage retrieval, cataloging & management of content, support customer roll out, on going support of components.

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**Senior/Principal High Level HDL Engineer** (multiple openings)

Seeking engineers with 5+ years experience beyond Bachelor's degree with declarative programming languages (specifically, functional programming languages such as Haskell and SML) and system software (such as operating systems, compilers and networking code). Familiarity with modern high-performance computer and network systems architecture is a strong plus. Familiarity with HDLs (Hardware Design Languages) is a plus. Responsibilities include design, evolution and improvement of proprietary design tools; design and development of verification methodologies; application of design tools and verification methodologies for specific products. Send resume to: [kevin.scott@sandburst.com](mailto:kevin.scott@sandburst.com) or mail to 600 Federal Street 2nd Fl. Andover, MA 01810. [www.sandburst.com](http://www.sandburst.com)

Softline Systems is seeking qualified Programmer Analysts, Systems Analysts and Software Engineers for the following positions to work at client sites throughout the US:

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Qualified candidates should send resume to Sagarsoft, Inc, Two Penn Plaza, Suite 200, Philadelphia, PA 19102 or e-mail to: [jobs@sagarsoft.net](mailto:jobs@sagarsoft.net)

**Systems Analyst.** Need 2 immed. to code, implement, test & maintain info. Systems & implement with DB's such as Oracle. Know Win NT, SOL, HTML & Java. Master's in Comp. Sci, Engg., Math or related field or Bachelor's in specified majors & 5 years progressive experience. Res. to HR, Unilinx, Inc., 4625 Alexander Dr., Ste. 110, Alpharetta, GA 30022.

**Systems Analyst-designs,** plans, tests, documents computer programs in GUI, (inc web-based online applications), using SQL Server & Win NT. Devlps. object-oriented design models using UML notations. MTA, 50 E 42, #708, NYC 10017. Ref-IG.

**Systems Analyst** wanted by New Jersey based Co involved in IS/IT Professional Consulting Services for job loc throughout the US. Must have Bachelors degree in Computer Science, Engineering and one year of experience in Computer Software Developing and/or Consulting. Respond to: HR Dept., Computech Resources International, Inc., 621 Shrewsbury Avenue, Ste. 3, Shrewsbury, NJ 07702. (Ref: RG7300IM).

**Programmer/Analyst:** Design, develop, analyze & support healthcare applications using languages such as: Visual Basic, C, Visual C++, Windows, Oracle, MSSQL, Crystal Reports, SQL Server, Activex Controls and IIS Server. Req. Bachelor's Deg. in Computer Sci., Eng., Bus. Adm., Math or related. Please fax resume to M. Gaddy 404-261-2245.

**PROGRAMMER** wanted by NJ Co. involved in Dvlpmnt & Mktg of specialized S/ware. Must have Bach in Comp Sci or Engg & 2 yrs software exp. Respond by resume to: HR Dept., AGO Insurance Software, Inc., 200 Valley Road, Ste. 404, Mt. Arlington, NJ 07856.

**Web Programmer/Analyst** wanted to design, develop, and maintain web applications. Master's degree and exp. req'd. Send resume to HR Dept., Gabriel.net, Inc., 145 Hudson Street, Rm. 804, New York, NY 10013.

**Enterprise Application Integration Architect** wanted for nationwide position by computer consultancy company based in New York, New York. Must have 5 yrs. consulting experience with three tiered architecture, and multi-platforms, 3 yrs. exp. with MVS, UNIX, and C, and 1 yr. exp. with MOSeries Architecture. Respond to: Account Manager, Computer Consultants International, Inc., 511 6th Avenue, PMB #90, New York, New York 10011. Please put Ref. No. BSC#01 on all correspondences.

**IT Professionals** Miami software development co. seeks several qualified: Programmers/Analysts Systems Analysts Software Engineers Design/Systems Engineers Must have B.S., M.S. in Comp. Sci., Eng., related/equiv. and/or relevant technical experience for position level. Prevailing/competitive wage. Send resume to HR, Powernet Int'l, 3785 NW 82nd Ave., Suite 112 Miami, FL 33166.

**Software Engineer.** Research, analyze, and update software/hardware systems to develop Human Resources, Billing and Payroll management. Analyze software requirements for feasibility. Evaluate interface hardware/software and overall systems requirement. Implement networking and security systems. Tools, Window NT, Novell, SOL, Server Router, C++ on Unix. Req. a MS in MIS & 1 yr. exp. Send resume to William Gelina, AHA, 24 Montrose Ave. Rutherford, NJ 07070

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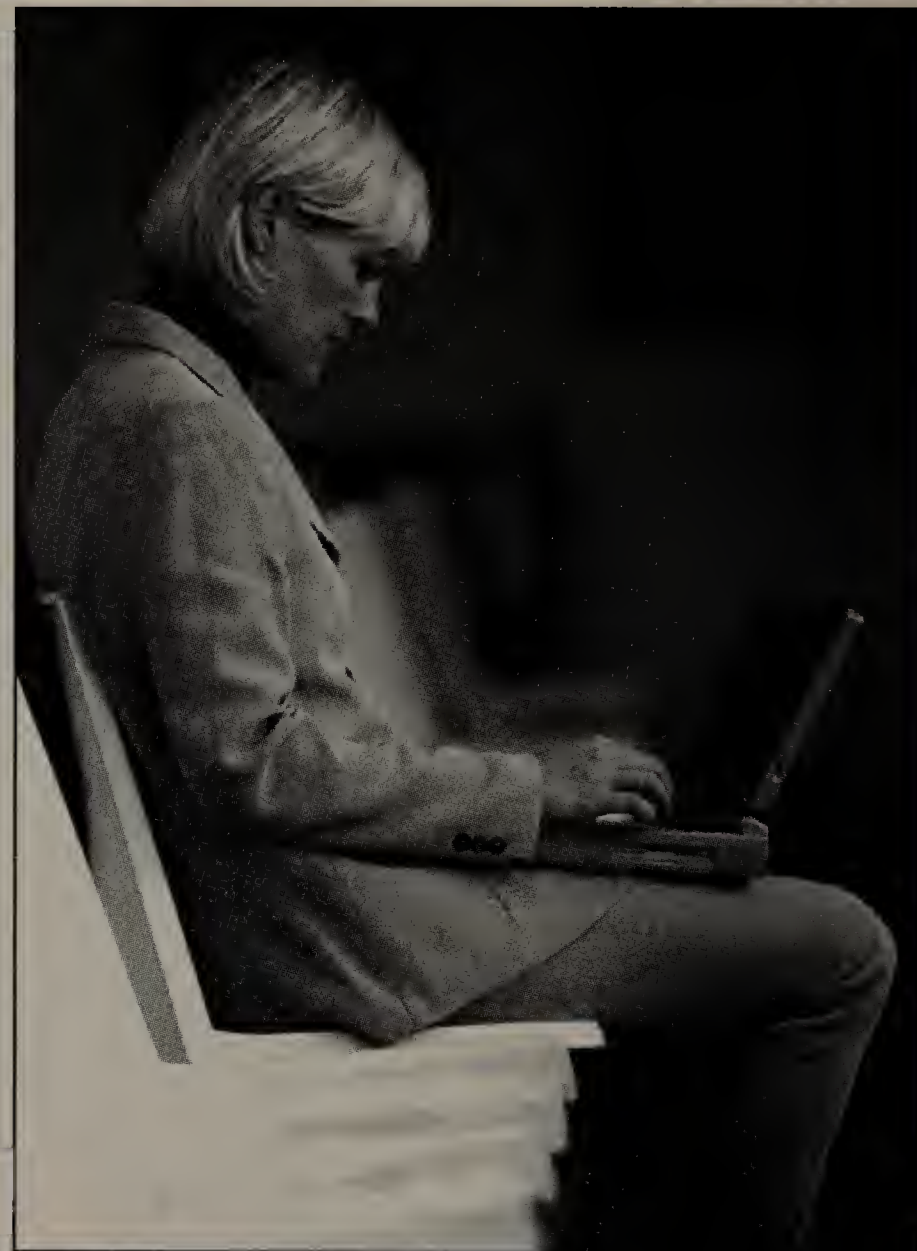
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#### Programmer Analyst

NE OH insurance firm seeks experienced Programmer Analyst: Experience with VisualAge Smalltalk, Object Oriented Analysis & Design, developing frameworks, using patterns, XML knowledge, to integrate XML in existing framework, DB2 experience developing of client/server applications, retractor of Smalltalk applications. Requirements: B.S. in Electrical Engineering/Computer Science & at least 2 yrs. exp. Send resumes to IT Recruiting Code: SCB025, Progressive Casualty Insurance, 6300 Wilson Mills Rd., Box N72B, Mayfield Village, OH 44143. Equal Opportunity Employer.

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Bachelor's degree in Computer Science or Engineering required. Three years of experience in the position or three years as a Project Leader/Manager and/or Programmer Analyst required. Experience in related occupation must include designing and analyzing software systems using TAL, C & SCOBOL programming languages for Tandem & NSKHIMALAYA operating systems.

40 hrs./week; 8:15am - 5:15pm; \$67,000/year. Must have proof of legal authority to work in the U.S.

Send resumes to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605; Attention: Joanne Breaux. Reference number V-IL 24914-N. AN EMPLOYER PAID AD. NO CALLS - PLEASE SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

Service Automation Services Inc is seeking to fill the following positions in Houston, TX:

System Analysts with Masters in Computer Science or Engineering and minimum of one year of experience in developing software using Powerbuilder, MSVC 5.0, Sybase SOL and in networking using Windows NT and Microsoft platform. Experience in full function accounting and service industry is preferred.

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Prevailing wage will be paid. Fax resumes to: 713-466-3750 or e-mail to sas@sasintl.com

Systems Analyst. 40hr/wk from 9a.m. to 5p.m. \$70,000/yr. Analysis, design and development of commercial application system using relational databases INFORMIX SE 7.2, fourth generation language INFORMIX 4 GL 6.04 and structured query language under UNIX operating environment. Require Master degree in Computer Science or Applied Physics and one year experience in job offered. Applicants must show proof of legal authority to work in the U.S. Send resumes to Illinois Department of Employment Security, 401 South Jackson; Reference #V-IL 23520-J. An Employer Paid Ad. No Calls. Send 2 copies of both resume and cover letter.

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Bachelor's degree in Computer Science, MIS, Engineering or Computer information systems and a minimum of 6 months experience in the above job or 6 months as a Computer Systems Analyst. Experience with one or more of the following languages required: C, C++, COBOL, SQR, and SQL. **(Code AAC)**

### Database Engineer

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Master's in Comp. Science, MIS, Engineering, Mathematics, or Science and a minimum of 6 mos. in the above job. **(Code DE)**

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SDI Technologies is a dynamic E business Systems Integrator based out of Pittsburgh, PA. With a global presence in over 4 continents, SDI is looking to expand rapidly its local presence in the following areas:

**Web Developer/Programmer:** requires a Masters or CIS or 5 years of work experience, ability to develop web based applications for Fortune clients using knowledge of Visual Basic, Active server pages and Java. Candidates will also need to know SQL, Oracle, VBScript, Java Script and SQL Server. Certification will be a plus. The candidates will require to travel and relocate to the client site for projects. Salary \$55K to \$65K.

**Administrators/Architect:** requires a Masters or CIS or 5 years of work experience, ability to develop and design application architectures for Fortune 500 clients using knowledge of databases like Oracle, SQL and Sybase. Working knowledge and experience of Unix, TCP/IP, Windows NT and Database administration is a must. Candidates will also need to know SQL, Microsoft Exchange, Windows 2000, Firewalls and Networking. The candidates will require to travel and relocate to the client site for projects. Salary \$60K.

Please mail or fax your resume with reference code "CW2365" to SDI TECHNOLOGIES, Attn: Human Resources, Penn Center West One, Suite 311, Pittsburgh, PA 15276 or email them to careers@sdiworld.com.

Sr. software engineer with  
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A shipping & distribution services company, located in Lafayette, Indiana, needs a Database Developer. Requires a bachelor's degree or equivalent with a major in computer science or related engineering discipline plus 2 years experience as a Database Developer/Administrator/Manager, Technical Analyst or 2 years experience in any occupation involving design and development of database. Send resumes: Manager, Human Resources, QuikPak, Inc. 3532 Coleman Court, P.O. Box 5685, Lafayette, IN 47903.



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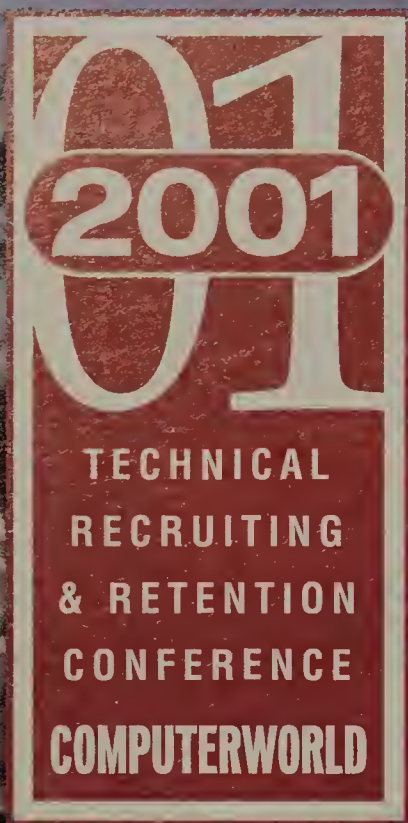
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# IT Careers in the East

**From once remote islands in Maine to the southern Atlantic Coast, the eastern seaboard stretches wide with opportunities for information technology professionals. Some of the nation's stalwart research facilities and businesses can be found here, with most all of them relying on or developing technology for the 21st century.**

**There's Lab Land, Silicon Alley and heavy, heavy demand throughout the area for the IT knowledge and vision needed to forge entirely new businesses and markets.**

## **Lucent Technologies Warren, NJ/Murray Hill, NJ**

The core of research and development for Lucent Technologies can be found in the hills of New Jersey. "There was a time when R&D focused on selling a box to our customers," explains Devan Prutzman, Lucent manager of recruitment marketing. "Today, we provide the applications and software that go with that box."

As one of the leaders in the newly converged communications industry, Lucent needs IT employees in wireless, software development, optical components, data networking and professional services. "We're hiring engineers, software programmers and scientists," says Prutzman. "We look for people who have a mix of technical and business skills."

Those skills translate into being able to listen, to assess customer needs, and to develop a technical solution. "We also look for a diversity of skills and backgrounds. That's what makes R&D function best – people who approach situations and issues from different views and angles," she says.

"We hire smart people to get a job done," she adds. "You'll work with your team and also reach out to work with other Lucent teams for some of the best in technical challenges. This really is a one-of-a-kind place – the breadth and depth of our portfolio is far and away better than any other in the industry," says Prutzman. "We don't buy solutions or enhance them – we create them. If you want to be part of building the next generation Internet, you'll want to be here."

## **Pitney Bowes, Inc. Stamford, CT**

Transformation is the word that comes up most often when talking about Pitney Bowes' business and its IT organization. Today the company is at the forefront of providing technology-based solutions to businesses for their mailing, messaging, shipping and document management needs.

Greg Buoncontri, vice president and chief information officer, says the company offers interesting, intriguing

projects for IT professionals. These include implementation of SAP enterprise systems, development of a new order-to-cash system and a new lease management system. "We have a lot of e-business activities under way," Buoncontri explains. These include building an Xtranet for larger customers and new products based on Pitney Bowes' software platforms and internal IT infrastructures. "We're also working on next-generation products – our postage meters, messaging suites, inbound/outbound shipping management solutions, and a complete conversion of our internal IT infrastructure to Microsoft Windows 2000, new Dell computers and Cisco networking technology."

Buoncontri has positions available in management and technical staffing. "We need SAP, Oracle, network engineers and technicians, Lotus Notes, and people with Broadvision and e-business platform development," he says. "Technical competence is just the first hurdle. We also look for results orientation, a customer-centric attitude and comfort with ambiguity."

Pitney Bowes' IT organization changed recently from a decentralized to centralized model with the new group known internally as TechCentral. The group supports the company's businesses, on a global basis: Mailing Systems, Document Messaging Technologies, Pitney Bowes Management Services and Pitney Bowes Financial Services and the corporate staff. In addition to learning through projects for the businesses, TechCentral employees are required to enroll in training to go deeper in their field or broaden to something entirely new, as well as learning that will help with personal effectiveness skills.

"We're making a tremendous investment in upgrading our technology. The mix of new people, growth, new technology and new organization make for a pretty exciting and interesting mix," says Buoncontri.

## **The Vanguard Group Philadelphia, PA**

While IT careers abound in many geographic areas, the Philadelphia area offers a hub of IT service companies, pharmaceutical companies and financial

services firms. "It makes for heavy demand and a lot of opportunity," says John Marcante, principal in charge of institutional IT for the Vanguard Group. "We have great colleges we can partner with and recruit from, which makes this area even stronger as an IT community."

Part of Marcante's mission is to recruit the best and brightest for Vanguard, an investment management company that was listed among the "Top 100 Companies that Best Leverage IT" by CIO Magazine. "To put it simply, our purpose is to create wealth for individuals and institutions. Today technology plays a huge role in financial services, especially in investment management. Our clients have varying financial needs, are sophisticated and are technologically savvy."

Vanguard's leaders believe the Internet enables shareholders to do what they need to do when and where they need to do it. As the only shareholder-owned investment management company in the country, this is critical to Vanguard's operation and streamlines the decision-making process. "We put our shareholders' needs first, so in 1995 we elevated our web capability in real-time mode," says Marcante. "At that time, our web site was centered around self-servicing, educating and empowering investors. While we still offer those valuable resources, today Vanguard.com brings together the power and knowledge of our crew to our shareholders."

Most recently, Vanguard initiated collaborative browsing and shared web sessions that allow Vanguard crewmembers to share web sessions with shareholders during complex transactions.

## **IT careers**

For more job opportunities with Eastern firms, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or [janis\\_crowley@itcareers.net](mailto:janis_crowley@itcareers.net).
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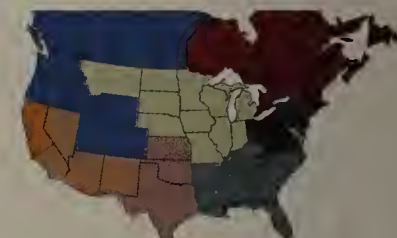
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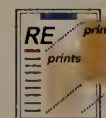


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**DDoS,**  
continued from page 1

more nefarious distributed denial-of-service attacks, which let an individual launch IP attack streams from hundreds, or even thousands, of compromised computers.

Web site operators are frustrated by the apparent inability of ISPs and Web-hosting providers to quickly filter out denial-of-service attack traffic when it pours into their routers and servers. Whether a low-grade nuisance or the kind of multibarreled assault that upended Microsoft's sites for three days recently, this "bad" traffic is eating up bandwidth and at times blocking legitimate traffic to the most prominent e-commerce sites.

"People are getting a little radical about it," said one attendee. For companies such as Yahoo and eBay, "it's a service-level agreement [SLA] issue with the ISPs and collocation providers." He predicted this year will see lawyers battling over whether distributed denial-of-service traffic should have to be filtered out to satisfy SLAs.

Despite the gloom, there are many efforts under way to cope

Clare, a product manager for Check Point Software and DDoS Working Group member.

The document is expected to define a common intrusion-detection method for collecting and measuring the percentage of bandwidth being consumed and a flow tag to identify traffic and other Layer 2 data collected from the packets. A firewall or other network device that implemented the DDoS Working Group specification would be able to report the start of an attack to the ISP, and other ISPs using compatible equipment would be able to share the information.

But it's uncertain whether ISPs can interact smoothly even if equipment makers support a common security specification, which may leave this as yet another security proposal that never got off the drawing board.

## ISPs in the middle

This much is clear: ISPs play the critical role in the distributed denial-of-service endgame against attackers, who are heavily armed with denial-of-service "malware," software posted at hacker sites for free use. And most of the intrusion-detection analysis and filtering that ISPs

which meets monthly.

"This is all part of the lesson learned after what happened last year," Moujtahed says. "ISPs like [Genuity], UUNET and AOL compete, but we are working together on this."

It's small comfort to the high-tech industry that the 16-year-old perpetrator of last February's incidents, a Canadian hacker nicknamed Mafiaboy, last month pled guilty to single-handedly attacking Amazon.com, eBay, Yahoo, Charles Schwab, CNN and eTrade, among others.

Mafiaboy carried out his distributed denial-of-service spree using attack tools available on the Internet that let him launch a remotely coordinated blitz of IP packets from servers compromised by agent attack "zombies." Mafiaboy awaits sentencing, but it's expected he won't get much more than two years in a juvenile detention center.

Those attacks forced most of the victimized e-commerce sites offline for about three hours. In the heat of battle to block the blitz of IP packets, ISPs did what they could through filtering bad traffic and claimed victory when it ended. But security experts familiar with what occurred

agree that this filtering accomplished little and that relief came because Mafiaboy simply stopped his attacks after three-hour intervals.

"The attacks happened Monday through Wednesday, and those guys were still

working Friday and Saturday to figure out what happened," says Frank Huerta, CEO of Recourse Technologies, which makes security gear to detect and trace denial-of-service attacks.

Like many experts, Huerta says the work ISPs did manually filtering bad traffic didn't stop Mafiaboy's attacks. And though law enforcement officials did extensive work bringing him to justice, one reason they succeeded was that he bragged about his exploits in an Internet chat room.

Microsoft two weeks ago became the latest high-profile victim of a distributed denial-of-service attack, though no one seems to be bragging about causing it. The software giant lost MSN.com, Carpoint.com,

Expedia.com and other Web properties for a day, hours or minutes over the course of a week.

Microsoft declined to explain its response to the attacks, other than to say it was working with the Federal Bureau of Investigation. However, CIO Rick Devenuti acknowledges that Microsoft "accepts full responsibility" for the inconvenience to its Web users. He says the company hadn't applied "sufficient self-defense" by using third-party products at the front end of its core network.

There are stopgap measures that Web sites can take to shore up defenses, such as using as many load-balancing and high-speed pipes as they can, as well as intrusion-detection systems that can indicate suspicious activity is suddenly on the radar screen.

And that is better than nothing. Fidelity Investments and Bear Stearns reportedly deployed Top Layer Networks' AppSwitch with its intrusion-detection features after last February's attacks on e-commerce sites.

## Finding a cure

Overall, there's a more sober-minded assessment of the problem among vendors than a year ago.

Cisco last February claimed that making use of ingress filtering in routers, a technology described in IETF draft RFC 2267plus, would stop denial-of-service attacks. But the router manufacturer has abandoned that stance.

"There is no silver bullet for a [denial-of-service] attack," says Lance Hayden, a manager with Cisco's consulting services team in Austin, Texas. But Cisco and a number of venture capital firms are investing in start-ups that are promising to develop comprehensive defense systems for distributed denial-of-service attacks (see story, page 37). Another start-up, Arbor Networks, is also striving to find a cure.

So, too, are established security vendors, including Internet Security Systems (ISS). Allen Wilson, director of emerging technologies at ISS and a DDoS Working Group member, says tracing this type of attack remains "very manually intensive and time-consuming. For ISPs, it's one hop at a time, and you need to get hold of people and let them know that your network is attacking theirs."

## NAI IS LATEST DoS VICTIM

Antivirus software vendor Network Associates was hit by a denial-of-service attack last week that hampered access to the company's Web site for about 90 minutes. Network Associates says the site never went fully offline.

Some users were unable to connect to the Network Associates Web site during the attack, while others could access the site but experienced slow responses. The company says its IT department noticed the denial-of-service attack immediately because it "proactively monitors anomalous traffic."

Network Associates declined to say whether it would be asking the FBI to investigate.

— Clare Haney  
IDG News Service

ISS claims to be developing technologies that depend on what it calls "the moving target defense." The idea is that if an attack is launched at a Web site, the victim and ISP work together to identify the source and then create a "black hole for the IP address," Wilson says. "You drop the packets but don't kill the connection, which helps trace back the attackers."

At the same time, you create a temporary IP address for your site that gets broadcast out to enable legitimate traffic to still find you.

Quantifying the denial-of-service problem is not easy. Whenever a Web outage occurs, security experts always suspect denial of service, even if the business blames internal screw-ups. Online auction vendor eBay has suffered several Web outages in recent months that many security experts suspect were denial-of-service attacks, something eBay vehemently denies.

See **DDoS**, page 76



**"The attacks happened Monday through Wednesday, and those guys were still working Friday and Saturday to figure out what happened."**

Frank Huerta, CEO, Recourse Technologies

with all manner of denial-of-service threats . . . and rays of hope are visible:

- Service and software providers have united to share information and forge common defenses.
- Promising security start-ups focusing on the problem are attracting big-name backers.
- Law enforcement groups — working with the network industry and its customers — are nailing the bad guys.

The DDoS Working Group is doing what it can to spur cooperation among ISPs. The group plans to publish recommendations for automated distributed denial-of-service defenses by the end of March.

"There are political issues and technical issues," says Tom

do is manual and difficult.

"We can't be held responsible for attacks on our customers," says Amir Moujtahed, director of systems engineering and corporate security at Epoch Internet, a Costa Mesa, Calif., ISP. "But if customers give us the IP addresses [of the source], we will block them." Epoch has intrusion-detection equipment from NFR Security on its external and internal networks, and Epoch engineers watch the logs closely for evidence of attack signatures. But it's a labor-intensive process.

Moujtahed says ISPs are trying to do their part by installing antispoofing filters and cooperating with competitors through informal agreements hashed out in the ISP Service Consortium,



# DoS MELTDOWN: ONE YEAR LATER

**DoS,**  
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However, it was clearly a denial-of-service attack that disabled much of the Undernet, part of the Internet Relay Chat network, in early January.

After last February's attacks, the Clinton administration asked the IT industry what it could do to help combat what everyone suddenly realized was a dangerous situation on the 'Net.

It took 11 months to come forward with a plan, but 19 high-tech corporations recently formed an organization called IT Information Sharing and Analysis Center (IT-ISAC), which will run a so-called "virtual center" to share information about denial-of-service attacks and software vulnerabilities in general. Founding members are paying almost \$1 million for the privilege, although general membership fees, which won't include access to all the information, drop as low as \$5,000.

The organization's database of shared information, which will be managed by ISS, is intended to help solve security problems, so vendors accessing this sensitive information have

agreed not to use it as a marketing weapon.

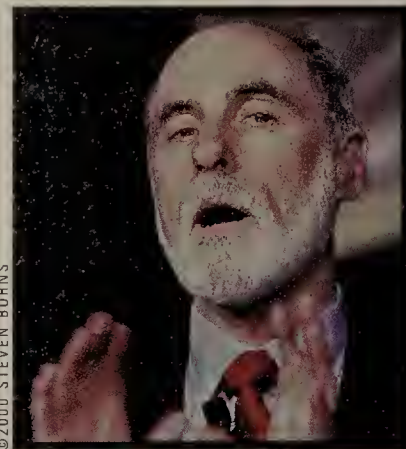
Those who expected ISPs to roll out new technologies or

for an extra charge, that would sort of be like blackmailing them."

Genuity expects new capabil-

ing service providers use reduce the negative impact of these attacks.

"Load sharing across multi-



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**"Load sharing across multiple servers helps reduce the impact of classic [distributed denial-of-service] attacks because there are multiple versions of a Web site operating across the Internet."**

Vint Cerf, senior vice president of Internet architecture and technology, WorldCom

services to help stop these attacks in the past 12 months have surely been disappointed. ISPs are essentially using the same spot-filtering and monitoring techniques today as a year ago. Nevertheless, ISPs claim heightened awareness and vigorous monitoring have helped reduce damage.

"We regularly see attacks, but nothing at the level of last year's on multiple, highly visible customers," says Kelly Cooper, security engineer at Genuity. "If we were to offer filtering and monitoring services to our customers

ities from router and switch vendors that will integrate IP address filtering directly into the operating system of the device. One of the most common reasons why ISPs are not setting up IP address filtering is because it can slow the network. However, if filtering is integrated into network devices, performance should not be hurt, Cooper says.

Vint Cerf, senior vice president of Internet architecture and technology at WorldCom, says that standard load-balancing and content-distribution techniques that many Web-host-

ple servers helps reduce the impact of classic [distributed denial-of-service] attacks because there are multiple versions of a Web site operating across the Internet," Cerf says. In addition to distributing legitimate traffic, load balancing and caching distribute rogue distrib-

**Showdown,**  
continued from page 14

would need to bait attackers to trace them, Dickerson said.

Likewise, CA's Neugent technology, which mines network data and promotes security improvements based on detected changes to network use, is not a cure-all, but a tool to be used along with firewalls and antivirus software, Perry said.

Check Point's Smith said his firm recognizes the need for faster firewalls and VPNs as Internet connections from companies get larger. He promised 1G bit/sec firewall and VPN protection by year-end.

When it came time to grill each other, several panelists

uted denial-of-service packets so one server is not crumbling under the weight of an attack.

ISPs also see hope in specifications being developed by the Internet Engineering Task Force. I-Trace is one preliminary technology that will allow ISPs to quickly find where a distributed denial-of-service attack originates. Once an ISP recognizes the source of an attack it can immediately set up a filter.

But this technology is very much in the early stages of development. All in all, it certainly seems like the industry will experience at least another year of being in the dark on distributed denial of service.

Network World Senior Editor Tim Greene contributed to this story.

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DocFinder: 2851

[www.nwfusion.com](http://www.nwfusion.com)

**VoIP,**  
continued from page 10

net and data services.

That level of convergence appeals to NCR Global Network Services, which wants to connect more than 400 of its offices across 88 countries to AT&T's MIS voice-over-IP service.

"On our Dayton, Ohio, campus we have 5,000 employees that move around often," says Greg Albrecht, a project manager. "Supporting IP voice over our wide-area network and LAN will mean users can take their phone and plug into any port and not miss a beat. But only if it's at the right price."

AT&T's pricing is still fuzzy, though the carrier says it will charge a flat rate of \$160 per port for its MIS voice-over-IP service. Customers that stay on-net can also expect credits because they are essentially saving AT&T additional costs by not generating traffic over its circuit switched voice network. The carrier says it will likely charge MRS voice-over-IP customers per location, but wouldn't discuss specifics.

AT&T is supporting its new

services via gateways that hand off voice calls between its data and circuit-switched nets. While the carrier wouldn't detail how many gateways it has rolled out, Giga Information Group analyst Lisa Pierce says AT&T has 28 H.323 voice-over-IP gateways overseas and 10 in the U.S.

AT&T's voice-over-IP technology of choice is H.323, but Earley says the carrier will upgrade to Session Initiated Protocol (SIP) "when the standard is more fully accepted." That means the company's adoption of the technology could be 12 to 18 months away.

SIP and H.323 are used to send and receive voice calls between the PSTN and data networks. SIP is widely touted as the better technology because it sets up and tears down these sessions with less delay.

SIP is also the technology of choice for WorldCom, which, as expected, aired plans for its IP Communications service at the show ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2856).

IP Communications is a fully managed service that will be available to WorldCom IP VPN customers. The service

will let users send domestic voice calls over WorldCom's IP network and the PSTN.

WorldCom is using SIP-enabled Cisco gateways for its new offering, but says it will support other vendors' gear in the future.

WorldCom says future editions of its service will enable customers to forego buying new and costly PBXs — a strategy that fits with telecom service reseller AmeriVision's plans.

"We anticipate a time when we may have SIP phones and standard PBX phones on our desktops, but we'd gladly give up our PBX to converge both voice and data onto a single network," says Henry Liverpool, director of network operations at the Oklahoma City company, which is testing WorldCom's service across three sites.

WorldCom says customers will pay a flat fee per site for on-net calls and a per-second usage-based fee for off-net calls, but declined to be specific. The service is slated to roll out between March and July.

AT&T: [www.att.com](http://www.att.com); WorldCom: [www.wcom.com](http://www.wcom.com)

questioned whether others had coherent product lines. For instance, to give customers a wide choice of security options, Symantec bought Axent, bringing firewall, VPN, vulnerability assessment and intrusion-detection products to Symantec's line of antivirus and content-filtering software.

But Clyde acknowledged the company is still working to integrate products.

Network Associates' Dickerson noted that his firm has grown dramatically through a string of purchases of other security vendors.

That poses challenges, according to Check Point's Smith: "They did the acquisitions, now you have to trust they do the integration." ■

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*Is broadband wireless a real contender?*

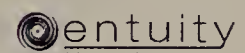
Service providers have invested millions in various forms of broadband wireless technology and the spectrum licenses needed to offer service. But broadband wireless has hardly made a dent in the remote access market for corporate users. Tune in and find out whether broadband wireless will become a real contender.

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February 9, 2001

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## New distribution meets old media

etter late than never, but too little too late: Thomas Middelhoff, Bertelsmann's CEO, announced a second Napster service to go live in June or July to offer music downloads from the BMG catalog for a monthly fee. I quote from *Network World* last week: "[Frank Sarfeld, senior vice president of the Bertelsmann eCommerce Group] said a survey of 20,000 Napster users conducted in December ... showed that a majority is willing to pay up to \$15 a month for the music download service."

When the BMG-Napster idea was first floated back in November I was high on it (see [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 2834), but why has their response been so, well, glacial?

Is this announcement, as it currently stands, a big deal? Well, in my opinion, the announcement is rather less important than some might suggest and certainly less important than I had hoped for.

For a start, the new service won't launch until the middle of the year — a full eight months (at best) since the original announcement. I'm not sure

what the intervening time will be used for unless it is to redesign the awful Napster software.

Second, we have no idea what the catalog of downloadable music will include, so we shouldn't get too excited just yet. My money is on it being — at least out of the gate — very limited in both artists and their material. While that's understandable, by the time the first version of the new Napster service is available, BMG-Napster will have missed one of the greatest marketing opportunities of the 21st century.

Why am I being so hard on the undynamic download duo? Because other companies are already out there doing what BMG-Napster could have done had they gotten their acts together faster.

My first poster child for the new sales channel for the old media is SightSound Technologies ([www.sightsound.com](http://www.sightsound.com)). SightSound offers full-length movies

for download. Although more than half of the catalog consists of "B" movies (pretty good ones at that), they now also have major titles such as "Guinevere." (By the way, the [sightsound.com](http://sightsound.com) site is a terrific piece of design — very well-organized, very effective, nice to use and good-looking.)

Movies on [sightsound.com](http://sightsound.com) can be rented for one or more days, while others are purchased to "own." The pricing of rentals and purchases is very reasonable (a few dollars), which is as it should be given the company's vastly reduced overhead.

Of course, if you don't have at least cable access, the 200M-byte-plus file size might be daunting. (Note to self: Encourage Gearhead to explain how SightSound manages digital rights to ensure that a rental is, indeed, only for the rental period.)

My second poster child in this market is eMusic.com. EMusic offers unlimited downloads of MP3s that cover all of the genres and range from old recordings to the very latest cuts. The cost of subscribing to this service is \$9.99 per month with an annual commitment or \$14.99 per month for three months. (The firm also offers downloads at \$0.99 per track and \$8.99 per album, but that doesn't make much sense to me given the low cost of subscribing.)

I have been very impressed with the eMusic service and the range of music available (I think I've downloaded around a half gigabyte in a month), and although I have yet to purchase anything from [sightsound.com](http://sightsound.com), I know I will.

This is what BMG-Napster has to compete against — other companies moving much faster, farther and sooner. It looks like SightSound and eMusic have the lead for now. And that advantage may often dictate who wins. In any event, it will be interesting to watch (and listen).

*Distribute your thoughts to [nucolmm@gibbs.com](mailto:nucolmm@gibbs.com).*

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MARK  
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The latest on the  
Internet industry

**BizRate.com founder** Farhad Mohit eyes every aspect of his business the same way comic Steve Martin's cop character on "Let's Get Small" looked at a shrunken motorist: "We're gonna have to measure you."

"Everything in our company is quantified," Mohit says. "And over the past six or eight months that the market has gone into its tail-spin, we have stepped that up even further."

This measurement mania has **BizRate** on track to break into the black before long, Mohit claims, and has also uncovered a number of counterintuitive truths about doing business online.

BizRate's calling card is a 10-category rating system of online merchants generated through surveys filled out by shoppers when they complete a purchase. The BizRate site is built for comparison shopping and the funneling of ready buyers to participating merchants, who in turn share a taste of the action with BizRate.

Getting impatient shoppers to fill out those forms and then visit the site is job one. Figuring out what works and what doesn't is where all the measurement comes in.

"We've done anything from a \$10,000 sweepstakes all the way down to \$50 instant-win," Mohit says of the inducements offered to complete the survey. "Interestingly enough, when you start analyzing the results, the \$50 instant-win gets a higher response rate than the \$10,000."

Why?

"The only thing I can think of is that it has a lot to do with credibility," he says.

In other words, shoppers believe they might actually win the \$50.

BizRate presumably has a Super Bowl office pool just like any other workplace in America, but the most spirited action at the company was a contest to see who could predict which of 18 "please fill out this form" banners would prove most effective. The smart money lined up behind those with dazzling designs and catchy wording ... but it was a plain Jane that attracted the most suitors out on the Web.

"Nobody picked the winning banner," Mohit says, "and we're supposed to be experts at this."

**The lesson:** Never mind the exotic flavors; vanilla sells ice cream.

"Clarity and credibility are most important," Mohit says. "If you look at our banners now, they're not too sexy. But when you see the banner, it's very clear that somebody is asking you to take a survey and it's a \$50 prize."

BizRate is patenting homegrown technology that records and analyzes which combinations of words snag the most shoppers so they can be whisked away to exactly the spot on the Web where they are most likely to part with their credit card number. Refining these calculations reduces BizRate's customer-acquisition costs and increases the bounties paid by merchants who receive better redirected traffic.

All this attention to detail has produced one unexpected cardinal rule, too. "Oh, 'click here' ... Interestingly enough, without the 'click here' written on the banner, people don't click there," Mohit says. "That's what testing does for you."

It also tells you what to stop doing. Remember the company's "Don't Get E-Screwed" TV and radio ad campaign? The spots were genuinely entertaining, but no matter.

"We basically killed all offline advertising because we couldn't measure it," Mohit says. "[E-screwed] was fun but did nothing for us. This year we went the total opposite direction. We did not do a single unmeasurable advertisement and basically focused all efforts online."

One last stat: BizRate's holiday-season survey found 67% of shoppers griping about slow Web sites, a situation that's bound to hurt the guilty parties over time.

"It's not a very forgiving environment out there," Mohit says. "That's common sense."

Which everyone knows is in short supply and cannot be measured.

*One measure of an effective column is the volume of mail it attracts. The address is [buzz@nwfusion.com](mailto:buzz@nwfusion.com).*



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One guy gets a six-figure severance package.

The other guy gets a coach seat to nine time zones

and a two-word mission from the chief: fix it.

The "synergy" that was supposed to happen  
with the merged companies didn't.

The operating units can't share data.

The employees work together fine;

the data storage systems don't.

It's too bad you can't take

storage systems offsite to bond.

#### >> storage fact

The average large company has six different computing environments, making consolidation a problem. Open IBM storage solutions, including Enterprise Storage Server™ and SAN, work with the systems of all leading vendors to streamline data retrieval. Storage matters. In the new economy, you're only as good as your infrastructure.

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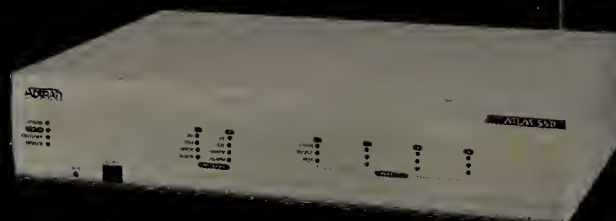


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ATLAS 550

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Frame Relay Access,  
Concentration and Switching

Frame Relay Routing

Converged Voice and Data

Multi-Protocol Data

Rates from 56 kbps to  
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Compressed Voice

FXS, FXO, E&M, and  
DSX-1 Voice

Private or Public Circuits

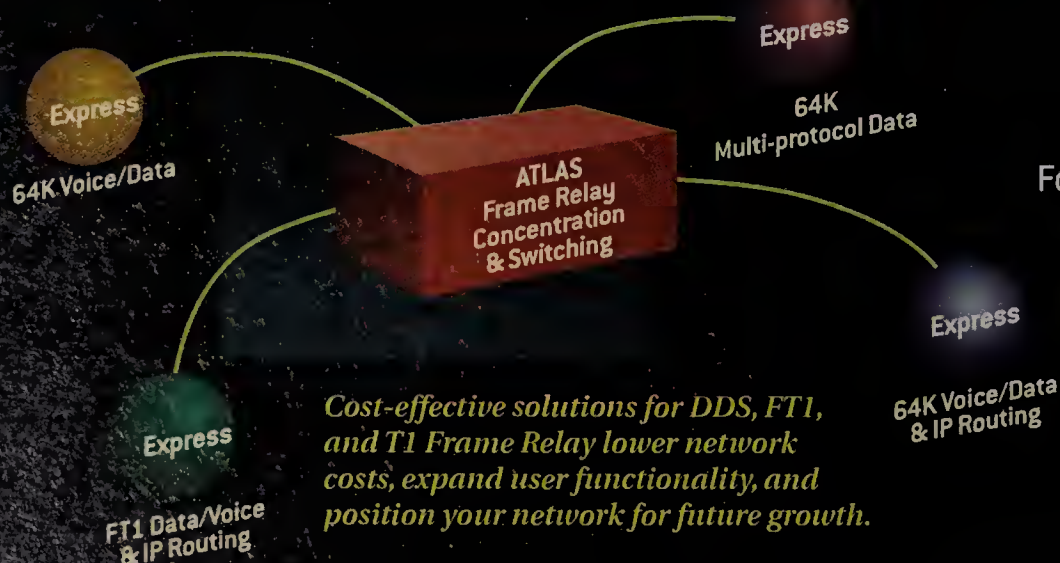
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